SIGGRAPH '87

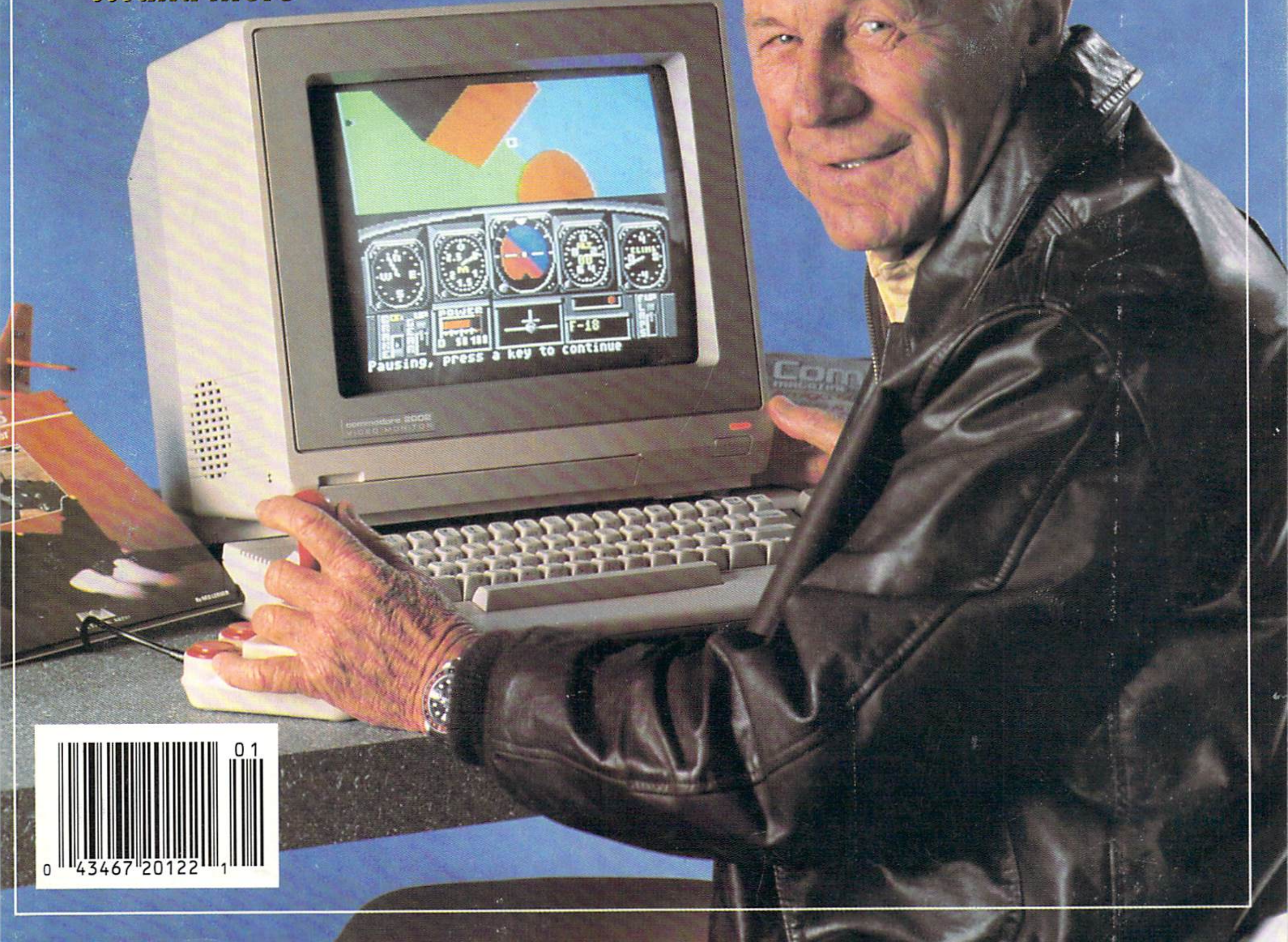
January 1988
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Commodore
MAGAZINE

The Magazine for Commodore and Commodore Amiga Users

Chuck Yeager Another First

SOFTWARE REVIEWS
64 & 128 Cauldron, Aliens
AMIGA Animator: Apprentice
...and more



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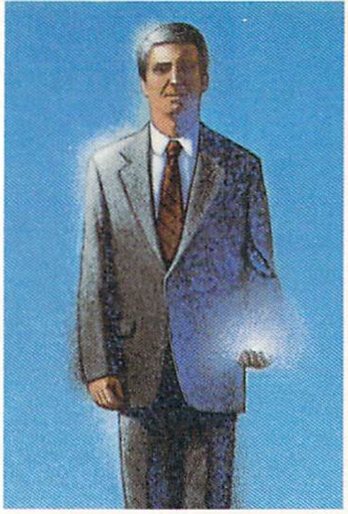


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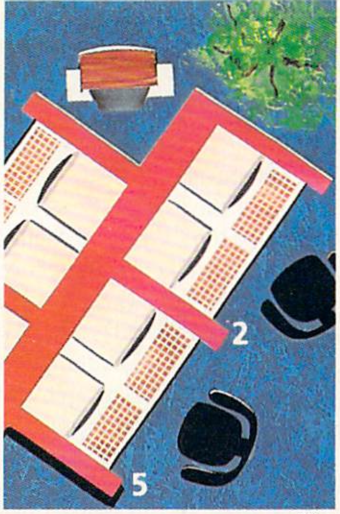
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Commodore
MAGAZINE

JANUARY 1988, *Volume 9, Number 1*



70



74

FEATURES

COVER STORY

COVER PHOTO: *Steven Unze*
Software: *Advanced Flight Trainer* by Electronic Arts

DEPARTMENTS

LETTER FROM THE EDITOR

Greetings:

I'd like to welcome all our new readers to *Commodore Magazine*, and at the same time, thank all of our old friends for helping us to grow to where we are in 1988. Whether you are young or old, a new reader or an old-timer, and whether you own a 64, a 128, an Amiga, or all three, I think that *Commodore Magazine* will have a lot to offer you in 1988. From news, to reviews, to type-in programs you can use, to feature stories on everything from hard drives to the SID chip, we're trying to provide you with the kind of magazine that you want.

Starting with this issue, you'll notice some changes in the magazine. Art Director, Gwenn Knapp, has been hard at work on fine-tuning the design of the magazine, and this month you see our new masthead and logo on the cover. Another change is that we've expanded the software reviews section of the magazine. We've divided the review section into 64 and 128 Software Reviews and Amiga Software Reviews. This allows us to increase our coverage of the Amiga family of computers, without sacrificing our 64 and 128 coverage. It also will let you more quickly identify the reviews for your particular computer. Also for Amiga owners, Amiga Tips & Tricks started appearing in October 1987, and we will continue our Amiga Public Domain and AmigaBASIC Tutorial columns. Watch for feature stories on Desktop Publishing, Wordprocessing and Animation.

For Commodore 64 and 128 owners, we are continuing our series on Interfacing Commodore's User Port by John Iovine. We've had a lot of positive feedback on this series, so we will keep it running until John runs out of ideas. Be sure to see his digital camera project in this issue. Louis Sanders' Tips & Tricks column is also continuing to be favorably received. So much in fact, that next month we are publishing a feature called "101 Tips & Tricks For Game Players" with all of the tips coming from reader mail. Other features to watch for include Desktop Publishing on the 64, a Disk Media Buying Guide and salutes to Epyx on their tenth anniversary and to Electronic Arts on their fifth. Our type-in programs for the 64 and the 128 will continue to provide an assorted bag of topics, from fractals to sprite and disk utilities to a variety of games.

Last of all, let me introduce you to the new cast of characters here at *Commodore Magazine*. Our new Publisher, Julie Bauer is a long-time employee of Commodore Business Machines and brings an extensive marketing and advertising background to the magazine. Expect to start seeing more advertising in our magazine, as well as a wider distribution as she begins using her skills. Although my position has recently changed (from Technical Editor), I have been with the magazine for almost five years now. I am going to try my best to keep the magazine on course with features, reviews and programs that fit your needs. Susan West recently joined us as Assistant Editor. She has a strong writing and editing background, including many years with Commodore Business Machines, and will make sure that quotes are properly placed and that the writing remains fresh and lively. Mike Rivers, our new Assistant Technical Editor, has a solid technical background and is now turning his expertise onto the problem mail that readers send in, as well as the type-in programs in each issue.

Though the personnel changes and the magazine evolves, the goal remains constant—to bring you the best Commodore-specific magazine on the market.

Jim Gracely
Managing Editor

Commodore
MAGAZINE

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ABC Membership applied for.

Hard Drive System for Amiga

Comspec Communications has announced the release of a new Hard Drive System for the Amiga. The system is divided into two parts: the SCSI Host Adaptor, which provides a Small Computer Systems Interface port, battery backup clock and autoboot circuitry and the Hard Drive Chassis, which allows for physical mounting of up to two hard drives or a hard drive and tape streamer, SCSI controller board, power supply, SCSI daisy chain connectors and a fan. Comspec's Hard Drive System is the only hard drive for the Amiga capable of automatically booting Kickstart and Workbench from the hard disk. For further information contact: Comspec Communications, Inc., 153 Bridgeland Ave., Unit 5, Toronto, Ontario M6A 2Y6, Canada. Telephone: (416) 785-3553.



Commodore Appoints President

Commodore Business Machines has appointed Max Toy president and chief operating officer. A computer industry veteran, Mr. Toy has held top management positions at ITT, Compaq and IBM. Most recently he was senior vice president of sales and government products of Xtra Business Systems, a division of ITT. At Compaq Computer, Inc., Mr. Toy was vice president of sales. He also held a variety of sales and marketing positions with IBM Corporation.

Mr. Toy's experience in establishing distribution networks and VAR programs is intended to complement the progress already made in the U.S.

Central Coast Releases

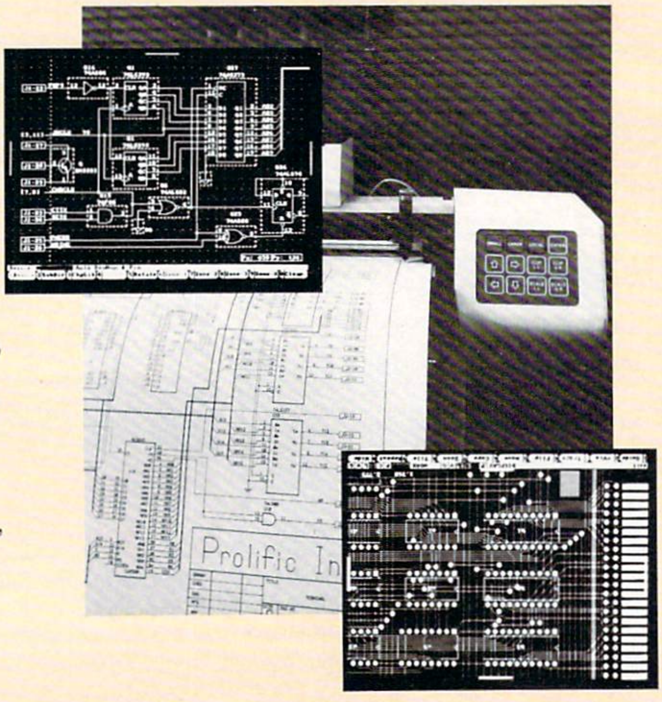
Central Coast Software has released two new programs for Amiga users. **Precisely**, a word processor which supports multitasking, multiple windows, keyboard macros, and on-line help, accepts documents produced with **PaperClip, SpeedScript** or **Pocket Writer** for the 64/128.

Quarterback, a fast hard disk to floppy back-up utility supports full/subdirectory/incremental backup and restore, with automatic formatting of diskettes, cataloging of files and diskette sequence numbering and checking. **Quarterback** is not copy protected.

Both products are available from Central Coast Software. **Precisely** sells for $79.95, **Quarterback** for $69.95. For more information contact: Central Coast Software, 268 Bowie Dr., Los Osos, CA 93402, phone (805) 528-4906.

Prolific Releases CAD Programs

Prolific, Inc. has introduced two CAD programs, **PRO-NET** and **PRO-BOARD** for the Amiga. The programs offer features such as automatic device number assignment and insertion of page for reference signals. In addition to the standard commands such as copy, move, and repeat, **PRO-NET** offers variable template size, selectable grid snap, grid show and grid size and intelligent zoom. The PCB layout program **PRO-BOARD** supports up to four layer PCB. Each product retails for $475; demo disks are available for $15 each. For more information contact Prolific, Inc., 1808 W. Southgate Ave., Fullerton, CA 92633, or call (714) 447-8792.

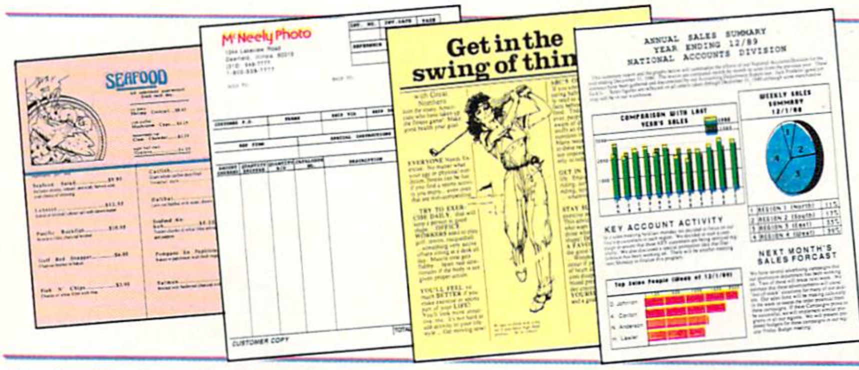


The 64 Emulator

Turn your Amiga into a Commodore 64 with The **64 Emulator** from ReadySoft Inc. Insert the **Emulator** disk into your Amiga and you have access to thousands of programs written for the 64. The **64 Emulator** supports all Amiga disk drives and printers, and an optional interface cable allows you to directly connect any 64 disk drive or printer. All video modes, color and sound are fully supported. Suggested retail price for The **64 Emulator** is $39.95 ($59.95 with interface cable). For details contact: ReadySoft Inc., P.O. Box 1222, Lewiston, NY 14092. Or call: (416) 731-4175.

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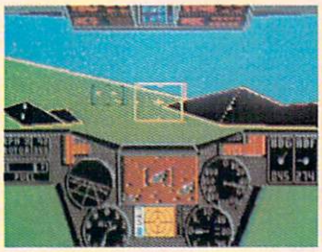
Taxaid Software, Inc. has released a new version of the **TAXAID** series of income tax preparation programs for the Commodore 64, 128 and Plus/4 designed for home use. The new edition includes all current changes in the tax laws for tax year 1987. **TAXAID** prepares IRS Form 1040, Schedules A, B, C, D, E and Form 2441 (Child Care). Calculations are automatic and tax tables are built in. The menu-driven program is available for $44.95 from Taxaid Software, Inc., 606 Second Ave., Two Harbors, MN 55616. Phone: (218) 834-5012.

Postcards

Activision has introduced a wacky new program called **Postcards** with which you can combine backgrounds, clip art and captions to produce goofy postcards on your Commodore 64. Clip art creatures include insects, dinosaurs, alligators, flamingos and wart hogs which you can transport via flying saucer, dog sled or parachute against a backdrop on the beach, desert or moonscape. Over 100 scenes, people, animals, structures, objects and modes of transportation are included along with a built-in paint program so you can design your own bizarre scenarios. **Postcards** retails for $24.95. For more information contact: Activision, 2350 Bayshore Pkwy., Mountain View, CA 94043. Or call: (415) 960-0410.

GeeBee Air Rally

GeeBee Air Rally, an arcade-style air race, has been released for the Commodore 64 and Amiga from Activision. The program offers 16 different in-air race courses featuring 3D scrolling graphics. The level of difficulty increases as the player progresses through the courses. The Commodore 64 version retails for $29.95, the Amiga version for $39.95. For details contact: Activision, 2350 Bayshore Pkwy., Mountain View, CA 94043. Or call: (415) 960-0410.



Thunder Chopper

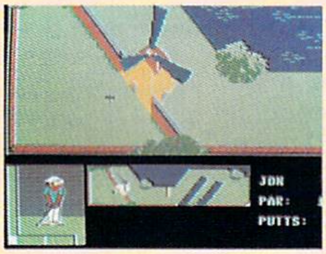
ThunderChopper from ActionSoft puts you at the controls of the Hughes 530MG Defender, a high-performance, scout/rescue/attack helicopter. The advanced helicopter simulation includes an on-board flight computer which provides mission instructions and pilot performance feedback. The "Heads Up Display" provides automatic enemy target tracking/locking systems. **ThunderChopper** retails for $29.95. For more information contact: ActionSoft, 201 W. Springfield Ave., Suite 711, Champaign, IL 61820. Or call: (217) 398-8388.

Superbike Challenge

Superbike Challenge is the latest offering from Broderbund for the Commodore 64. The fast-action arcade game lets players race at speeds of up to 200 mph on 12 challenging Grand Prix courses. **Superbike Challenge** allows two players to race each other and view the race on side-by-side windows, or a single player can race a computer-controlled biker. On-screen indicators include speed, RPM, lap times, race position and course layout. Suggested retail price is $19.95. For details contact: Broderbund Software, 17 Paul Dr., San Rafael, CA 94903-2101. Or call: (415) 492-3200.

SATCOMM-64

SATCOMM-64, a satellite tracking program for the Commodore 64, is now available from Strategic Marketing Resources, Inc. The program will indicate the location of up to 15 different satellites for amateur radio operators who need to know when each is accessible and where to aim their antennas for successful communication. SATCOMM-64 is available for $15.95 from Strategic Marketing Resources, P.O. Box 2183, Ellisville, MO 63011. For more information call: (314) 256-7814.



Mini-Putt

Accolade has released **Mini-Putt**, an animated miniature golf game for the Commodore 64. Up to four people can play on different courses representing themes such as famous movies, sports and countries around the world. **Mini-Putt** lists for $29.95. For more information contact: Accolade, 20813 Stevens Creek Blvd., Cupertino, CA 95014. Phone: (408) 446-5757.

Halls of Montezuma

Electronic Arts has released **Halls of Montezuma**, a battle history of the U.S. Marine Corp designed by SSG, for the Commodore 64. **Halls of Montezuma** simulates USMC historical conflicts from the Mexican War to Iwo Jima to Vietnam in eight pre-programmed scenarios or in scenarios that you design. **Halls of Montezuma** retails for $39.95. For details contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.

Infiltrator II

Mindscape has released **Infiltrator II**, a sequel to their popular combat helicopter simulation. The successor pits recovered Captain Johnny McGibbits against the Mad Leader in a fight-to-the-finish rematch. **Infiltrator II** incorporates three land-based graphic adventures in addition to the airborne combat mission. Suggested retail price is $34.95. For further details contact: Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. Or call: (312) 480-7667.

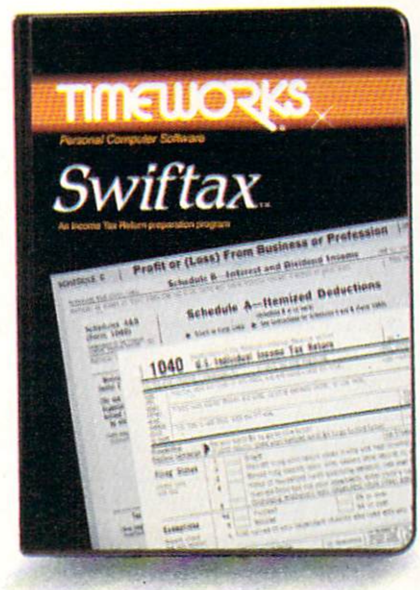
Hot & Cool Jazz

Electronic Arts has released its second Music Creativity Library Disk, titled **Hot & Cool Jazz** for use with **Instant Music, DeluxeVideo** and **Deluxe Music Construction Set** on the Amiga. The program contains over 40 tunes in various styles including Ragtime, Swing, Bebop, Latin and Fusion Jazz. **Hot & Cool Jazz** retails for $29.95. For

Continued on page 12

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Continued from pg. 10
more information contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.

The Black Cauldron

The Black Cauldron, based on the Disney film of the same name, is an Electronic Arts fantasy for the Amiga set in the mythical land of Prydain. You play Taran whose mission is to locate and destroy the black cauldron made from the curses of an evil king. Suggested retail price is $39.95. For more information contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.



Voice Master "Junior"

Covox, Inc. has released the Voice Master "Junior," a low-cost version of their Voice Master speech digitizer and voice recognition device. Voice Master Junior is a self-contained unit with built-in microphone that plugs into the joystick port. It allows hands-free desktop use. Speech or other sounds are recorded into memory and can be saved to disk. Word recognition templates enable up to 32 words or phrases to be used at one time. Voice Master Junior comes with the **Covox Composer**, which lets the user write and compose music by merely whistling a tune; it can then be edited, saved or printed out. Retail price is $39.95. For details contact: Covox, Inc., 675 Conger St., Eugene, OR 97402. Or call: (503) 342-1271.

Aegis AudioMaster

Aegis Development, Inc. has released **Aegis AudioMaster**, a digital sound sampling and editing program for the Amiga. **AudioMaster** allows you to manipulate any digitally sampled sound, mix sounds together, alter their waveform and save them as instruments to be used in other Amiga music programs. Sample lengths vary according to available memory. For example, 512K will accommodate a two-minute sample. **AudioMaster**'s suggested retail price is $59.95. For further information write to: Aegis Development, Inc., 2210 Wilshire Blvd., Suite 277, Santa Monica, CA 90403. Or call: (213) 392-9972.

Leisure Suit Larry

Electronic Arts has released **Leisure Suit Larry in the Land of Lounge Lizards**, an adult adventure game designed by Sierra On-Line for the Amiga. You control Larry, our hapless hero who spends a night in the fictional town of Lost Wages where he attempts to overcome the odds and seduce the woman of his dreams. Looks, lack of money and even bad breath can complicate Larry's success, just like in real life. **Leisure Suit Larry** retails for $49.95. For details contact: Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. Or call: (415) 571-7171.



CompuTrainer

CompuTrainer bicycle trainer from RacerMate connects with the Commodore 64 or 128 to electronically match road conditions by simulating hills, wind conditions and the rider's inertia by means of a microprocessor-controlled eddy current brake. CompuTrainer consists of a Brain Box with 8-bit microprocessor which sends commands to the Electronic Load Simulator creating an exciting computer racing game in which the rider can race on famous courses, create custom courses or randomly generate the terrain.

The **Racer-Mate Challenge**, an optional interactive software cartridge transforms training sessions into time trials in which you can race against your past performance. CompuTrainer retails for $595, **Racer-Mate Challenge** lists for $99.95. For more information contact: RacerMate, 3016 N.E. Blakeley St., Seattle, WA 98105. Or call: (206) 524-7392.

Real Estate Investor

Jance Associates has released **The Real Estate Investor V 1.2** for the Commodore 64 and Plus/4. **The Real Estate Investor** allows prospective buyers to analyze the possible financial and tax consequences of their investments. The program calculates mortgage payments, mortgage amortization, anticipated cash flow, property appreciation and income tax consequences for owner-occupied and tenant-occupied investments. **The Real Estate Investor** is not copy protected and is available for $25.00 from Jance Associates, Inc., P.O. Box 234, East Texas, PA 18046. Phone: (215) 398-0434.

The Mission is Vital. The Odds are Against You.



You're one of the elite . . . parachuting alone behind enemy lines. The enemy controls the terrain, hidden in bunkers and machine gun nests . . . you may be surrounded. You might complete the mission if you crawl through the ravine and approach from the rear . . . or maybe a frontal attack will take them by surprise.

MicroProse has broken new ground with **AIRBORNE RANGER**, the quality action game where tactical thinking and lightning reflexes determine your fate. Your missions will vary as much as the climate and terrain. Slip silently into position to rescue prisoners trapped in "tiger pits" from a P.O.W. camp, or throw caution to the wind and try to destroy a key munitions dump in the desert. But watch out . . . enemy troops can attack from any direction.

The action is fierce as you control one soldier's battle against overwhelming odds. You'll need skill and strategy to outmaneuver your enemy, plus courage and some luck to make your escape. Along the way, search out that hidden cache of weapons and first aid supplies . . . you'll probably need them.

AIRBORNE RANGER

AIRBORNE RANGER is a fast-paced, quick-to-learn game with 12 desperate missions in three different regions of the world. You'll be running, walking and crawling across full-scrolling, 3-D terrain. Arm yourself with an M-16 assault rifle, bayonet, LAW rocket (Light Antitank Weapon) or time bomb, but be wary of enemy submachine guns, antitank rockets, robot minitanks, minefields and flamethrowers.

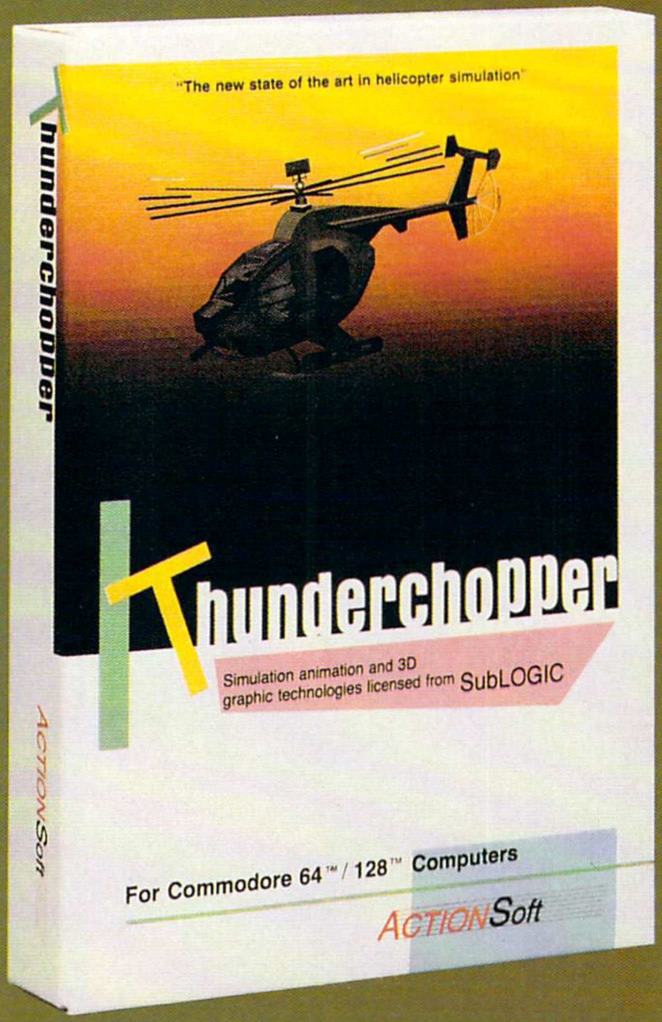
AIRBORNE RANGER . . . **More than just a great game. It's an adventure.**

AIRBORNE RANGER is available from a "Valued MicroProse Retailer" (VMR) near you. Call us for locations! For Commodore 64/128, IBM-PC/compatibles and Apple II+/e/c. Call or write for specific machine availability, and for MC/VISA orders if product not found locally.



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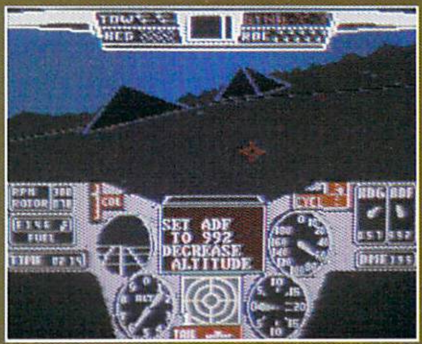
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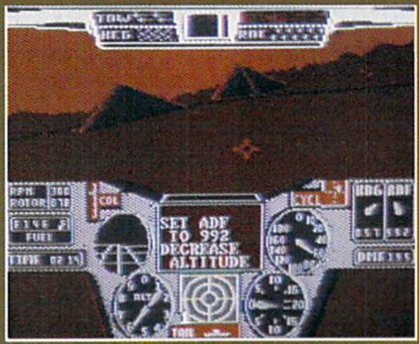






C64 Screens shown. Other computer versions may vary.

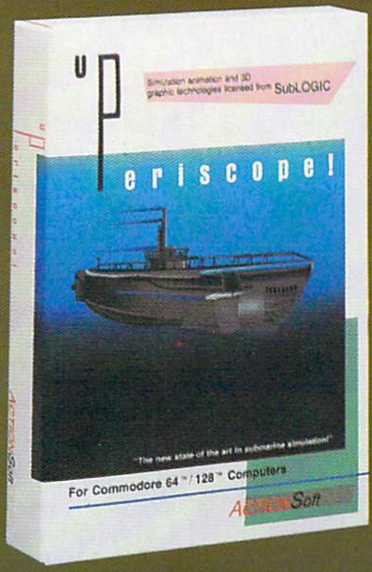






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Compiled by Louis F. Sander

LOU SANDER'S TIPS & TRICKS

This month Tips & Tricks explores new territory—literally as well as figuratively. Honduras and Chile represent our 49th and 50th contributing countries, while tips for the Amiga and PC-type computers are our first ever on these exotic and mysterious machines.

Add to that our customary selection of type-in programs, commercial software tips, computer room hints, on-line machinations and the like, and you have a wonderful potpourri to ring in the new year.

If you'd like to share your own ideas, write them up and send them in. Many contributors use Q-Link E-Mail to LFS. More traditional folks send them, one per sheet of paper, with every sheet containing a return address, to:

Louis F. Sander
Post Office Box 101011
Pittsburgh, Pennsylvania 15237

Yes, the P.O. Box number was selected with computers in mind. (The Postmaster calls it decimal, but we know it's binary). And yes, we pay money for every tip we print. Most of them get $10, and the best get up to $50.

New Year's Treat: Fire up your 64 and see how the accompanying program works. It's the Spritemaster Snaders' way of welcoming 1988, done with their usual explosive sound, pyrotechnic graphics, and bang-up animation.

You'll have to type the program in, because we aren't revealing what it's all about (at least not directly). But like most of Bob & David's software . . . "It's short and it's sweet, and it does something neat." It's a dazzling New Year's treat for you, courtesy of:
Bob & David Snader
Baltimore, Maryland

```
10 PRINT"[CLEAR,YELLOW]
    HAPPY NEW YEAR FROM BOB & DAVE
   SNADER!":POKE 2040,13
   :DIM M(39),N(39)
15 P=832:Q=1:R=255:S=54296:V=53248
20 FOR J=0 TO 38:READ K,L:M(J)=K
   :N(J)=L:NEXT:FOR J=0 TO 4:READ K,L
   :POKE V+K,L:NEXT
25 POKE V,R-225*RND(0):Z=100*RND(0)+50
30 POKE V+39,Q:POKE P+18,16
   :FOR Y=230 TO Z STEP-1:POKE V+1,Y
   :NEXT:POKE S,15:POKE S,0
35 POKE 53281,1:FOR J=1 TO 3:NEXT
   :POKE 53281,0:FOR J=0 TO 38
   :POKE P+M(J),N(J):NEXT
40 FOR K=0 TO 300:NEXT:Q=Q+1
   :IF Q=8 THEN Q=1
45 FOR J=0 TO 38:POKE P+M(J),0
   :POKE V+1,PEEK(V+1)+1:FOR K=0 TO 50
   :NEXT:NEXT
50 POKE S,5:POKE S,0:GOTO 25
55 DATA 019,040,016,017,022,016,013,
   130
56 DATA 025,131,010,041,028,040,015,
   007
57 DATA 017,192,007,108,006,030,008,
   240
58 DATA 004,068,009,097,011,012,012,
   128
59 DATA 014,002,001,131,000,003,002,
   128
60 DATA 018,056,020,056,021,064,023,
   004
61 DATA 024,129,026,002,027,006,029,
   192
62 DATA 031,068,034,068,030,008,032,
   032
63 DATA 037,198,033,016,035,016,040,
   130
64 DATA 036,016,038,016,043,130,033,
   000
65 DATA 021,001,032,000,023,001,029,
   001
```

Notes from PC Land: Here's what I've observed about my month-old PC, as compared to my long-familiar 128/Plus-4/64/VIC/PET machines:

- The PC is much less fun. Commodore-land has *lots* more interesting programs and *lots* more interesting programmers.
- Though my own machine is a $3000 AT clone, Commodore's inexpensive PC's look very, very nice, and will fill most people's needs with lots of power to spare.
- The hard disk drive makes loading and saving instantaneous. Other than the price, that's the biggest tangible difference in the systems.
- Another big difference is the filenames. MS-DOS is limited to eight very specific characters, while *we* get to work with sixteen of anything we want.
- The difference in the keyboard layout is driving me insane, but I do like having four separate cursor keys.
- The 80-column EGA display is great. The CGA isn't, but it's

Continued on pg. 102

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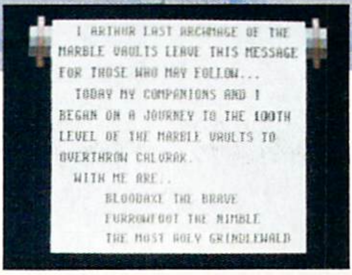
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AMIGA Tips & Tricks

Compiled by Tim Jones

If you have an item that you would like to submit for use, you can send it to:
Commodore Amiga Tips
651 Outrigger Dr.
Deltona, FL 32728

Amiga Date Idea: For those of us who haven't gone out and invested in one of the various hardware clocks available for the Amiga 1000, here's an addition to the Startup-Sequence to help us speed up our boot sequences.

Because of the complex nature of AmigaDOS calls, it is possible to redirect the input and output of a command. By using this along with the RUN command, we can "multitask" a portion of our startup so that things progress at the best possible speed. If you have an entry in your Startup-Sequence that looks like this:

```
Date ? > NIL:
```

as a method of forcing yourself to reset the date and time each time you reboot, you know that the system suspends operation until you enter the appropriate data and hit RETURN. Here's a fix for that that demonstrates a couple of features only available to the Amiga owner. Try changing the Date entry in your startup to the following:

```
RUN DATE <CON:452/12/180/21/DD-MMM-YY HH:MM
>NIL: ?
```

The results are quite surprising and while the new task is waiting for you to enter the date and time, your system will continue to execute any additional instructions in your startup file. You will find this most effective if you place it at the beginning of the file.

If you have other time-consuming functions that block the continuation of the startup of your machine, you could insert a RUN command in front of them, increasing the boot speed of your machine even more. The best way to find out is to experiment. If you do experiment, be sure to do it on a backup of your normal boot disk so that you don't mess up a working version of your Startup-Sequence.

[This was submitted to me early in the series, but I lost the address of the author. I do remember his city and state, so, if you think this sounds like your submission, please drop me another note and I will be glad to give you credit (and a check) for your work. - taj]

Author Unknown

ASK for Amiga 500/2000 Owners: Here's a neat way to conditionally install CLI commands into a RAM disk and then assign the appropriate virtual volumes. Included on the 500/2000 Workbench disk is a command called ASK. ASK allows you to make an entry into a batch file (in this case, Startup-Sequence) that prompts a user for a yes or no response. The syntax for ASK is:

```
ASK "Any text question in QUOTES"
```

Then handle the response with an IF WARN statement (WARN is true if the first letter of the user's response is "Y" or "y"):

```
IF WARN
  {operation}
ENDIF
```

Here's an example that I use to install my C directory into RAM:

```
Echo ""
ASK "Install the CLI commands into RAM:Drive (Y or N)? "
IF WARN
  MAKEDIR RAM:C
  COPY C: ALL RAM:C QUIET
  ASSIGN C: RAM:C
ENDIF
```

Then before the line ENDCLI > NIL:, I place the following:

```
IF EXISTS RAM:C
  NEWCLI CON:540/150/100/50/CLI
ENDIF
```

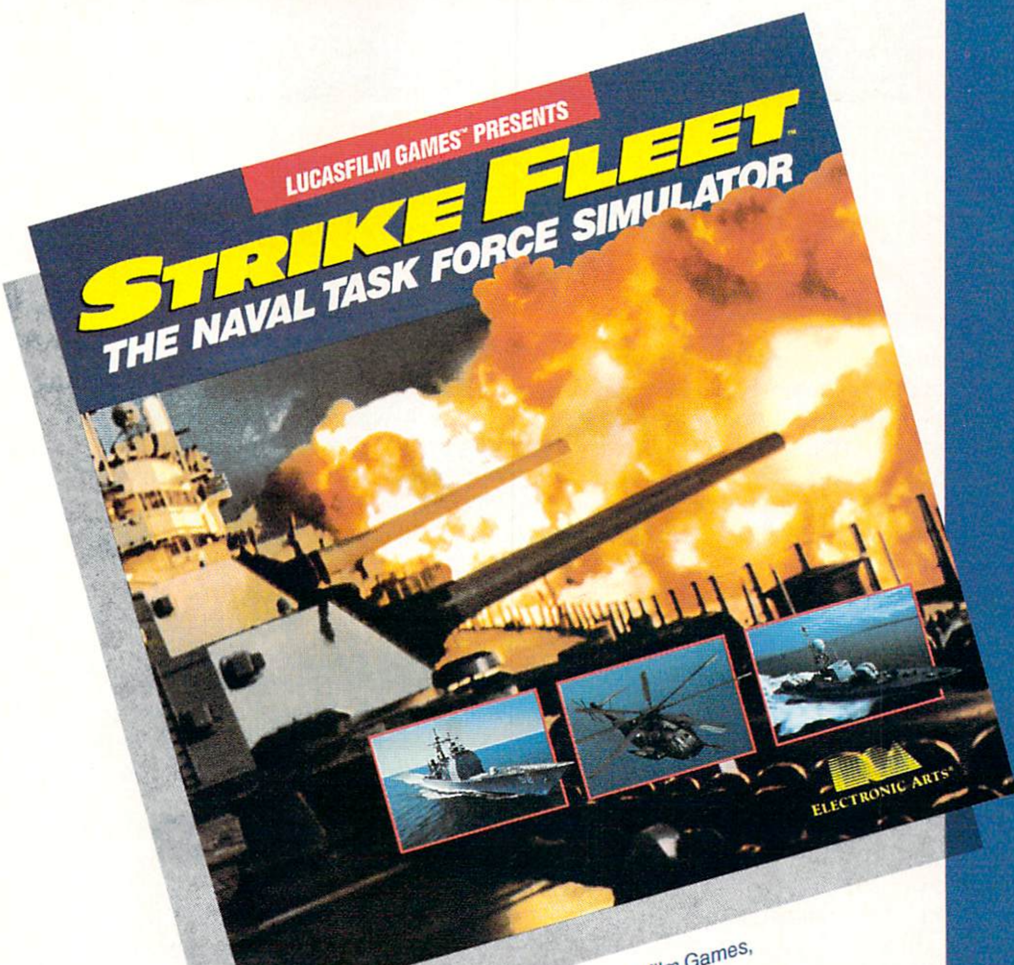
This allows me to decide whether to work in a Workbench-only environment or to create a CLI for use with these commands. If the commands were copied to RAM:, it is safe to assume that I want to use a CLI environment, while a lack of

Continued on pg. 114

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Screen shots represent C64 version. Others may vary.

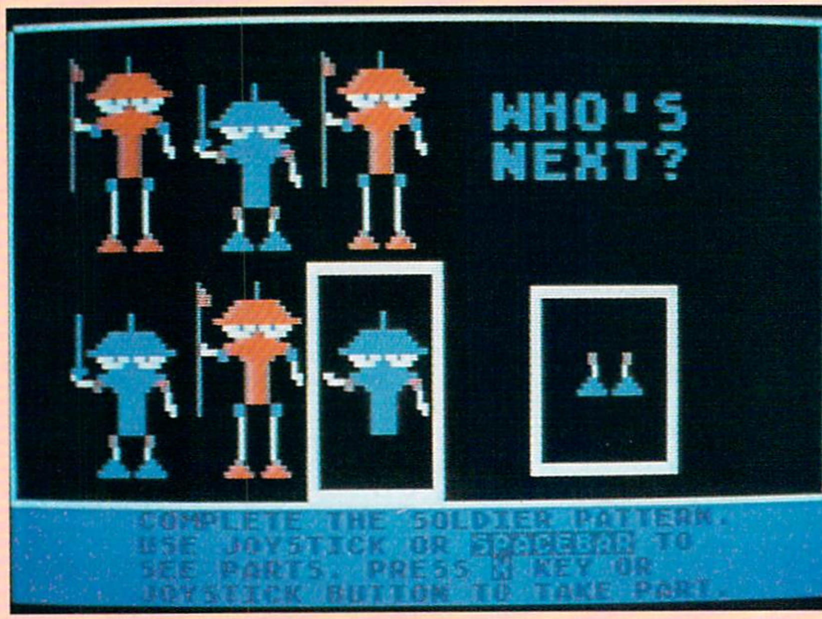
HOW TO ORDER: Visit your retailer or call 800-245-4525 for direct VISA or MasterCard orders (in CA call 800-562-1112). The direct order price is $29.95 for the C64 version and $34.95 for the Apple version. Send a U.S. check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add $3 shipping and handling ($5 for shipping to Canada). Please allow 1-2 weeks for U.S. delivery. C64 is a registered trademark of Commodore Electronics Limited.

ELECTRONIC ARTS®

Reviewed by Jack Emberly

Castle Clobber

Computer: Commodore 64
Publisher: Thunder Mountain Division
Mindscape School Software
3444 Dundee Road
Northbrook, IL 60062
Medium: Disk
Price: $9.95



Lively sound, inventive graphics, and numerous surprises make *Castle Clobber* great sport for kids four to thirteen.

In this three-level educational adventure, the robot Tonk is piloted through a maze of castle rooms in search of Tink-Tonk Land's stolen toy chest. Mean King Gork who took the chest from the saddened town folk, thwarts Tonk with trap doors that send him back to TinkTonk Land and menacing soldiers cart him off to "jail." But Tonk may triumph by following a map of the castle and remembering the whereabouts of obstacles and locked doors. By winning games of pattern recognition Tonk acquires keys to doors concealing the chest. Lively sound, inventive graphics, and numerous surprises make *Castle Clobber* great sport for kids four to 13. I like the systematic treatment of visual perception skills needed for grade one reading and the critical thinking skills demanded throughout school.

Level one, (for 4-7 year olds) begins in the "Spooky Garden" leading into the upper floor of the castle. Using joystick or keyboard one guides Tonk into the castle's upper and lower rooms. Soon Tonk finds the "keys" he may hold and use should he win one of five spatial orientation games that now appears on screen.

Good Pre-Reading Activity

In "Odd Keys Out" the child examines 16 keys similar to the one found in the adventure. The task is to isolate four that are different from the other twelve.

"Pair the Keys" displays eight mixed keys that must be arranged in four equal sets.

In "Four in a Row" one studies 20 keys to discover four in sequence. Levels two and three add keys to each game.

"Build Me Exactly" requires the child to study the color and shape of a soldier's four parts (head, body, legs, weapon) and build a similar soldier given two choices for each part. In level two there are four choices for each part; in level three the soldier disappears and must be rebuilt from memory.

In "Who's Next" the child "analyzes" the height and shape of five soldiers to find the pattern which predicts the dimensions of a sixth soldier. In level one the pattern is the same from soldier to soldier; by level three it changes from figure to figure. Teachers should appreciate this painless way to introduce Bloom's taxonomy of thinking skills-analysis and synthesis. All five games will help grade ones distinguish commonly reversed "b"s and "d"s. Noting details could improve the spelling of older kids. The choice of Adventure or Games on the menu allows adults to select these activities for extended drill at their discretion.

Winning or losing games returns one to the Adventure in progress and its hazards. At level one these consist of locked doors and Gork. The emphasis here is on visual discrimination.

In level two Tonk encounters more hazards and surprises, and a dungeon connected by stairways. Trap doors appear suddenly to whisk him back to his starting point. Bumping into soldiers sends him off to jail. On the good side, Tonk discovers lanterns, shovels, and magic boxes which may help him escape darkened chambers and jail but their applications must be discovered by experimentation. The result is problem solving by trial and error.

Useful objects may also be held and traded with Boomer, an ally should Tonk find the key to release his friend from jail. The challenge then is to locate keys, objects and hazards and through a planned route safely acquire the tools for victory. In level two kids in grades two through five learn to plan and follow the most expeditious routes. In small groups debate rages on whether to first acquire useable objects, release Boomer or forge ahead in search of the chest. Thus cooperative problem solving becomes a major outcome of the fun.

Players must succeed with level two to learn the password to level three (grade sevens love it). Here catacombs appear beneath the dungeon. These dark passages are connected by stairs to the two upper levels. Now trap doors may close behind Tonk to end play. Only careful map reading will take the adventurer to the prized toy chest.

Castle Clobber's three levels of play are good educational fun for any elementary child. The program comes with back up disk and documentation containing maps and instructions. ■



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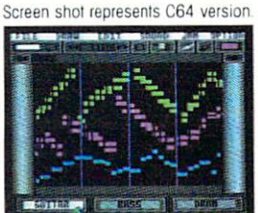
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Screen shot represents C64 version.



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Reviewed by Scott A. May

Street Sports Baseball

Computer: Commodore 64
Publisher: Epyx, Inc.
600 Galveston Drive
P.O. Box 8020
Redwood City, CA 94063
Medium: Disk
Price: $34.95

To participate in back yard sports is almost a constitutional right for kids growing up in America. Although the setting may differ according to region—a grassy field, vacant lot or urban side street—the fun and neighborhood camaraderie are universal. This spirit of impromptu competition is the theme behind *Street Sports Baseball*, the first in a new series of games by Epyx. Like the real-life events they salute, *Street Sports Baseball* will appeal to players of all ages and abilities.

The game's first option is the choice of two locations, a concrete parking lot or a grass field. The only difference between the two settings is the type of obstacles that litter the outfield. Going for fly balls isn't easy with obstructions like bird baths, dirt piles, bushes and puddles to contend with. The position and type of obstacles changes from one game to the next.

Games can be played against a streetwise computer team or another human opponent. Teams can be either hand-picked from scratch, recalled from previously saved groups or randomly chosen by the computer. Select new teams and you'll get to know the personal strengths and weaknesses of each player. There are 16 members of the 52nd Street Hall of Fame, each a tiny terror in the neighborhood leagues.

One of the nicest qualities of this game is how each player is treated individually in terms of ability. As in real life, some are better than others, but each contributes something special to the team. Each has a name and distinct personality. This is also the only computer baseball game that includes females in the line-up. Watch out guys, most of these girls can run circles around you!

A coin-flip determines who picks first and which team starts at bat. There are only eight players per team — the computer handles the catcher's mitt for both



Getting a hit is not difficult (which is one reason why this game is perfect for all ages), but aiming your hit requires a deft touch.

sides and the pitcher covers home plate after the ball is hit. Next, each player decides the team's field position and batting order. Here is where you make the most of your talent, rag-tag as it might be. Review each player's abilities and make your assignments.

The playfield screen contains a scoreboard at top and two windows showing different perspectives of the field. The largest window displays a 3D view of the action—from behind the batter's box to each position on the field—depending on the location of the ball. A smaller window shows an overhead view of the entire field, helpful for tracking fly balls, base runners and outfielders' positions.

There are only four basic pitches—fast, slow and right/left curve balls, but the joystick controls the ball all the way to the plate. The large window provides the best view for pitchers to guide the ball.

Pitchers will find it fun and challenging to fool batters (even the computer-controlled type) with quick-changing throws. Start out fast and slow it down right before it passes home plate, or do just the opposite. Curve balls are especially tricky to hit, but be careful—too much inside curve and you'll hit the batter, resulting in a walk.

From the batter's point of view, hitting the ball is simply a matter of concentration. Getting a hit is not difficult (which is one reason why this game is perfect for all ages), but aiming your hit requires a deft touch. The inherent qualities of each player must be considered. Some swing too early, some too late. Take this into account and swing according to who is at bat.

Once the ball is hit, the main window automatically displays the fielder closest to the ball. The smaller window now shows the entire field, the path of the ball and where each fielder stands. Right before the ball appears on-screen, a message is flashed indicating whether it is a fly ball or grounder. Fly balls cast a shadow on the ground. Follow the shadow, not the ball itself, and you'll make the catch most of the time.

Fielding the ball is very simple, yet success depends on two factors: the fielder's abilities and the obstacles present. Running into a bush or slipping in a puddle causes your fielder to fall down, losing time and coordination. A butter-fingered player might also catch the ball and drop it, or let a grounder slip between his or her legs. Despite errors, most hits garner only singles. A home run fence can be seen in the distance, but such power hits are extremely rare.

Throwing the ball to each base is a snap. Simply point the joystick in one of four directions—as though it were a baseball diamond—and press the fire button. Players automatically move to their assigned bases and catch the ball. When playing the computer, one trick is to hesitate before throwing from the outfield. The runners will continue to advance, giving you the chance to throw behind them and possibly force an out.

Likewise, base runners will automatically advance after a hit, unless they are on second or third with no one behind them. In this situation you can seize control of the runner and force him or her to run. Stealing bases is unheard of, but during the heat of play, runners can "go for it" and slide into base.

The game's graphics are large, colorful and cute. The animation, especially the batter and pitcher, is very well done. Sound plays an important role also, from the "thwack" of a nicely-hit ball to the occasional honk of a nearby car horn.

Street Sports Baseball is nicely paced, colorful and lots of fun for players of all ages. Like its real-life counterpart, it is informal, not too serious, and totally entertaining. The only thing missing is your mother calling you home for dinner.

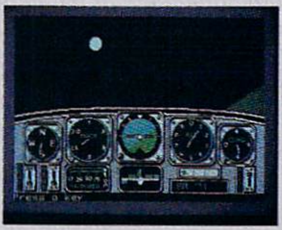
"Finally, The Right Stuff"

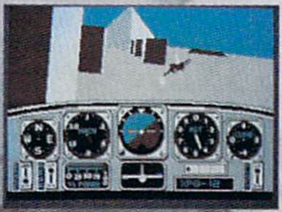
–NY Times *(Aug. 25, 1987)*



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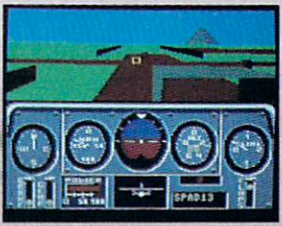
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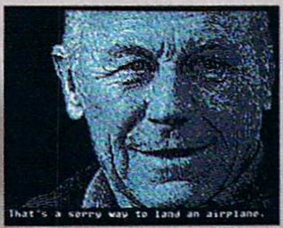




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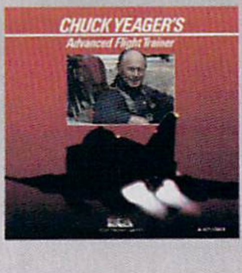
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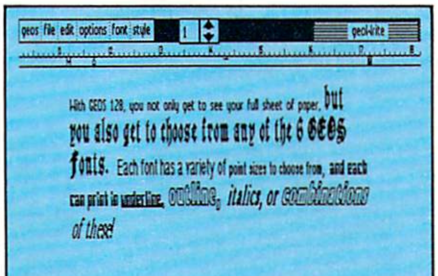
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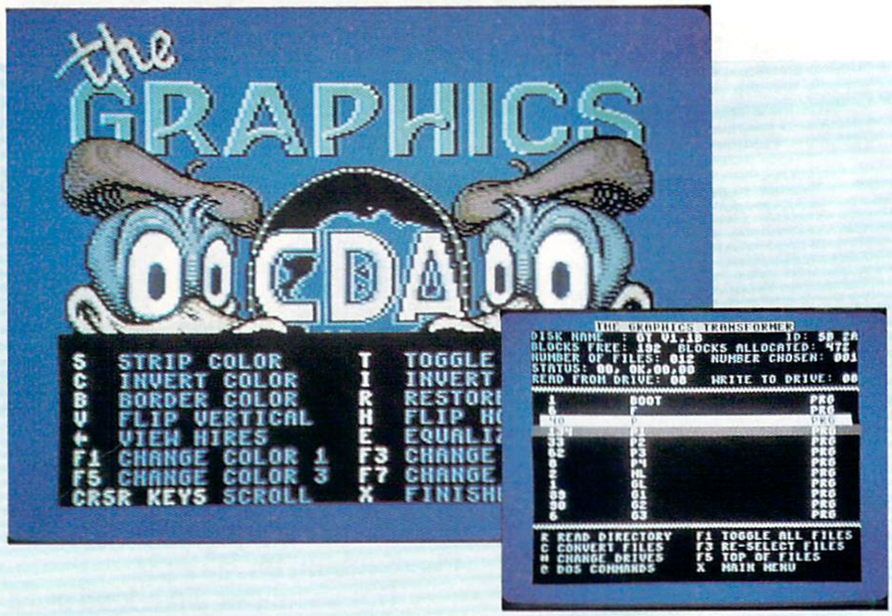
Berkeley Softworks

The brightest minds are working at Berkeley.

Reviewed by Gary V. Fields

The Graphics Transformer

Computer: Commodore 64
Publisher: CDA, Inc.
561 N. Main Street
Yreka, CA 96097
Medium: Disk
Price: $34.95



If you've ever tried to do graphics conversion by brute BASIC programming force, you'll understand why *The Graphics Transformer* is a genuine answer to a prayer.

The Graphics Transformer is a collection of graphic utilities which can convert screens from one drawing program to another, plus a little more.

Who would be interested in such a product?

Anyone who uses more than one graphic program and desires to use the drawings or clip art designed on one with the other. Perhaps you have used *Doodle!* for years but have recently purchased *GEOS*. Over the years you have created some impressive graphics which you would like to incorporate in a *geoWrite* document or a *geoPaint* design. How do you translate them into files GEOS recognizes? Without a utility program like *The Graphics Transformer* you are out of luck — either you must manually recreate those graphics or forget them. But now all you have to do is boot this program, cursor through the intuitively designed menus, and in short order the graphic is ready to be used by nearly any drawing program on the 64 market.

Why must a graphic be converted to be used by different drawing programs?

Unfortunately there is no standard format for packing graphic codes for the 64 system as has been established for the Amiga. In the absence of such a standard, individual programmers have devised their own methods for storing and retrieving code. As a result, a legion of powerful programs are on the market which are foreign to each other. *The Graphics Transformer* serves as a translator for those programs.

How does Graphics Transformer work?

The entire program loads into the computer's memory (in 20 seconds), not just a portion. After it is loaded you can remove and store the program disk. This is important since you will be switching disks as you load graphics created by one drawing program and resaving the converted program to another. Using the program is simple and logical. First you are presented a screen which lists all the different graphic programs it is compatible with. There are over two dozen on the list, including the more popular ones plus several I have never heard of: GEOS, *Flexidraw Flying Colors, Kwik Paint, Computer Eyes, Cadpak 64, Animation Station* and *Sahara Abstraction* are but a few of the mix.

To begin the conversion process you simply cursor down the list, highlight the name of the program your design was created with and press RETURN. Next a conversion screen appears. Again you cursor to highlight which program you want the file converted to. You can also convert a graphic file into a "stand alone" or "multi" file, which I will mention in a minute.

After you've made a selection you are presented the DOS screen. Here you can read a disk directory, select and load files, convert the graphic or return to the main menu. After reading a disk's directory into memory, you simply cursor through the listing and highlight the file (or files) you want to convert. After the graphic is loaded, the power screen of *The Graphics Transformer* is displayed.

Does *The Graphics Transformer* have any other unique or interesting features?

Yes. Not only can you convert graphic files to formats which alien programs can handle, but you can also create "stand alone" and "multi" files as well. With the "stand alone" option, you can convert and save files which can be loaded and displayed independently of any graphic program. To load and display a drawing you simply type: LOAD "filename",8,1 and the graphic will appear on screen just as it originally appeared when it was stored to disk.

The "multi" file option allows you to relocate the graphic load to a memory location you specify. This option would be useful for anyone designing a game program in which they would like to use their graphics for displays, playing fields, etc.

Is The Graphics Transformer worth buying and why?

If you own only one graphic program, you don't need *The Graphics Transformer*. But if you have collected several over the years, chances are you'll find this program invaluable. It is logically designed, does what it claims and does it quickly. My only complaint is—Why did you guys wait so long? I've needed a utility program like this for years.

Reviewed by Scott A. May

Wargame Construction Set

Computer: Commodore 64
Publisher: Strategic Simulations, Inc.
1046 N. Rengstorff Ave.
Mountain View, CA 94043
Medium: Disk
Price: $29.95

To loyal fans of computerized battle simulations, *Wargame Construction Set* represents a dream that has finally come true. Play one of the eight pre-designed war games included on the disk, or build your own versions of military conflicts. Both diehard strategists and novice armchair generals will find a lot to like in this dynamic, feature-laden program.

The program's greatest asset stems from the talents of designer Roger Damon, author of S.S.I.'s *Panzer Grenadier*, *NAM* and *Field of Fire*. Damon evokes a user-friendly style without sacrificing authenticity — no easy task considering the complexity of most computer war games. Lush graphics, easy-to-use joystick commands, intricate scenarios and fast gameplay characterize a typical Damon design. The author shares some of his secrets in *Wargame Construction Set*, resulting in a program with real long-term play value.

The program consists of two parts: game scenarios and the Editor. Novice players — and those unfamiliar with Damon's style — should begin with a few trial games. Five one-player and three two-player games are included to spark your imagination and display the Editor's powerful features.

The eight pre-designed games offer a wide range of styles and difficulty levels. Scenarios include historical re-enactments ("Rommel's 88's," "First Bull Run"), textbook military maneuvers ("To Cross a River," "Fulda Gap"), fictional confrontations ("Delta Force Rescue," "Castle Siege") and futuristic battles ("Return to Beta 4"). *Wargame Construction Set* is flexible enough to create combat simulations of almost any time period, from medieval conflicts to intergalactic megawars.

Specifications for each pre-designed game are detailed in the back of the users manual. Information includes a description of the scenario, the number of players, map configurations, unit statistics and the overall objective.



ART BAXTER

Create combat simulations from medieval conflicts to intergalactic megawars.

Veteran war gamers will find the users manual up to S.S.I.'s customary standard of excellence.

All games consist of a series of phases that comprise one full turn. Game turns typically include Observation, Fire and Movement phases for each side. A Victory phase indicates which side is favored in the battle at the end of each turn. Finally, a Save Game phase allows players to continue the game at a later date.

Two-player games feature additional fire phases, depending on the scenario. Games that support the Artillery Plot phase allow both sides to summon off-board artillery fire. Such force is so damaging—often simulating atomic weaponry—players may wish to delete this phase. Another phase unique to two-player games is Opportunity Fire. Here a player may interrupt an opponent's Movement phase and fire any unit reserved from the previous turn. This is a powerful defensive tactic, used against advancing armies.

Damon's use of joystick controls simplifies gameplay tremendously, especially in two-player scenarios. The joystick moves a cursor in eight directions across the smoothly-scrolling battlefield. When placed atop a player's unit, its ID number and vital information are displayed on a status line near the bottom of the screen. This information is helpful for status reports before and after an attack.

At the heart of the program is the Game Editor, a comprehensive and somewhat intimidating look behind the scenes. Novice designers will find it much easier to alter certain aspects of a pre-designed game rather than starting completely from scratch. Soon you will understand how each change affects different features in the game. It also gives you the unique opportunity to study how professional designers use *Wargame Construction Set* to achieve desired effects. The final step before committing an original design to disk is to follow the editing tutorial outlined in the manual. This will take you step-by-step through the entire process, including game genre, theme, plot, map construction, unit design and deployment. Graph paper is recommended for sketching preliminary map layouts.

Players will soon discover two factors that will either make or break a good war game: terrain placement and unit design (both friendly and enemy). Terrain features include: roads, bridges, blown bridges, trees, crests, hilltops, woods, mines, buildings and rivers. Each terrain type affects different units in terms of movement and line of sight. Players must be careful not to box off prime objectives with impassable terrain.

Keep in mind that nothing you can do will cause the program to crash. Poor planning, however, can render the most attractive design virtually unplayable. Few people will get everything right the first time out; re-editing your designs is inevitable. Always consider your final objective to avoid design errors.

Unit design is complex, yet fascinating to experiment with. Each unit (both friendly and enemy) contains a wealth of interactive parameters: firepower, defense, assault, movement, strength and range. Fire type determines unit weaponry: small arms, machine guns, anti-tank and heavy explosives. Unit types for both sides include infantry, tanks, engineers, mortars and cannons. Friendly units can also contain trucks, helicopters and boats.

Wargame Construction Set tackles a serious game genre with unusual style and grace. Roger Damon and S.S.I. have created a masterpiece of long-term entertainment value. ■


The time: 1400 hours. Somewhere in the Pacific. Some ill-fated coordinates in World War II.
Damage Control reports a hit on the starboard side. Send in Alpha, Baker and Charlie to repair.
eyeball to eyeball action. This time around you'll be right in the middle of it all. You knew it wouldn't be pretty.
But how tough could it be to rescue a downed pilot?
Will it be the twin 40mm Bofors anti-aircraft guns? Or the 5" lead-spewers aft? Depth charges or torpedoes? Autopilot or guts?
LIFE, LIBERTY AND THE HAPPINESS OF PURSUIT.
Radar spots inbound Zeroes. Ready forward gunnery positions. Man the anti-aircraft turrets. They're coming.
You're at the helm, commanding the greatest concentration of firepower ever put in a lightweight fighter. The deadly Fletcher Class Destroyer.
You've embarked on the first simulation that actually combines the intricate, large-scale strategy of wargaming with the intensity of furious,
It sure seemed a lot easier than shelling islands, escorting a convoy or hunting subs.
Or so you thought. But now look what you've got. Thirteen fully-operational, earbursting battle stations to worry about, all armed to the gills. Not to mention radar. Navigation. Sonar.
And half the Japanese fleet crawling up your spine.
Time to make some tactical decisions.
YOU'VE ALWAYS DREAMED OF BEAUTIFUL MODELS. Now you can pick up an entire assault fleet, including a replica Fletcher Class Destroyer, from Revell. Or win an authentic scrambled eggs flight deck cap. Sweepstakes details are in every box, or write for an entry coupon. No purchase necessary. Sweepstakes ends June 15, 1987. Official rules are available at participating dealers.
Any choice could be your last, so make it good.
Suddenly, you hear the ominous rumble of incoming Zeroes. You fire, and send one plummeting to the sea, trailing a plume of smoke.
On instinct, you instruct the bridge to commence evasive maneuvers.
Even though, by experience, you know there's nowhere to run.
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EPYX
DESTROYER
537

Reviewed by John Jermaine

Aliens

Computer: Commodore 64
Publisher: Activision
2350 Bayshore Parkway
Mountain View, CA 94043
Medium: Disk
Price: $ 34.95

Each marine has volunteered to sacrifice his own life to save the others, by detonating his grenades when the safety of the group is threatened.





Aliens, developed and marketed by Activision, is a special collection of six mini-games in which the player participates in events from the movie of the same name. The characters of Newt and Ripley are both included, and you must control the actions of Ripley in many phases of the game.

The first phase of the operation challenges you to pilot the drop-ship as it descends through the planet's atmosphere. This sequence isn't a true flight simulator, with complicated controls to master, but it delivers an easy-to-understand flight simulation which everyone should enjoy.

Once the troops have landed, four marines are sent out to search the interior of the Atmosphere Processor Building. Unfortunately, the aliens quickly become aware of their presence, and the second game has you directing a systematic retreat of your men to the APC (Armored Personnel Carrier). This exercise can become complicated, considering that a large enemy force is closing in on the marines' position.

When your people have been extracted from the area, they are driven to a new location in the complex. The Operations Room Rampage takes place when the squad becomes hopelessly surrounded. You must defend your position until one of your men can cut an escape route through a heavy steel door. This particular game forces the player to quickly analyze the situation and deal with each alien as an individual, even though you have to worry about eight lanes of invading creatures simultaneously.

As the group leaves the Operations Room behind them, Newt suggests it might be safer to travel through the air ducts. A fourth game, the Air Duct Maze Scramble, has Newt, Ripley, and the surviving marines desperately trying to find a route out of the building. If the team is captured, it means a slow death for everyone. Each marine knows the score and has volunteered to sacrifice his own life to save the others, by detonating his grenades when the safety of the group is threatened. Once again the user becomes an armchair general. During this evacuation maneuver, an accident places Newt in the hands of the enemy.

Even though the nuclear reactor of the complex will explode in 17 minutes, Ripley disregards her own safety and sets off to rescue her young friend in the Newt Rescue Race. There are a number of things to worry about during a relatively short period of time. For one thing, you are using the range locator to find Newt. Secondly, Ripley must leave a trail of flares to show her how to get back to the elevator. As you search for the child, blast aliens that pose an immediate threat, but try to conserve your ammunition for the encounter with the queen in the alien nest. Smart players become clock watchers and gauge their activities to the remaining time.

The final challenge is a brutal One-On-One Confrontation with the alien queen. Ripley commands a power loader during this epic battle taking place on the military transport ship. These loaders are heavy duty second bodies for their operators, and powerful enough to deliver a mean jab to a big bad alien spoiling for a fight. Weaken her as quickly as possible, grab the creature at the right moment, and drop her through the air lock to complete the final task of the mission.

Alien's graphics are well done and accurately depict their big screen counterparts. I was very pleased with the way the alien creatures looked in the games. Steve Cartwright must have had a difficult time analyzing those distinctive mugs and making them look presentable on the 64. Even though the Aliens are basically black figures, with some white detailing added, their appearance is more than just acceptable.

It's interesting to note that your foes move differently than the human beings in the program. Some aliens are faster than others, and it seems that certain "bugs" are more aggressive when you encounter them in a game. The Operations Room scene really looks sharp, while the graphics display of the flame thrower in action is equally impressive. It would have been nice if the digitized transitional screens could have contained more details, but they still look good, and their movie dialogue is very entertaining.

You may recognize something familiar about the "Drop-Ship Maneuvers" game. It made its debut in Activision's *Master of the Lamps* program and challenged the user to guide a flying carpet through a series of mystic colored rings. This whole sequence was re-vamped for *Aliens*. Now the software pilot of your group has the opportunity to fly the drop-ship to the landing field, by maneuvering the craft through a computer graphic pipeline. As you enter the planet's atmosphere, you feel as if you're actually flying the craft. The image on the screen shakes, a low roar is heard in the background, and the ship's hull begins to glow, as the outer skin of the vessel makes contact with the atmosphere.

Aliens also contains original theme music and a nice collection of realistic sound effects. As you progress through the story line of the movie, you'll hear automatic gun fire, the unmistakable sound of feet walking across catwalks, a noise emitted by the creatures themselves, and the hy-

Continued on pg. 52


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 Reviewed by Mark Cotone

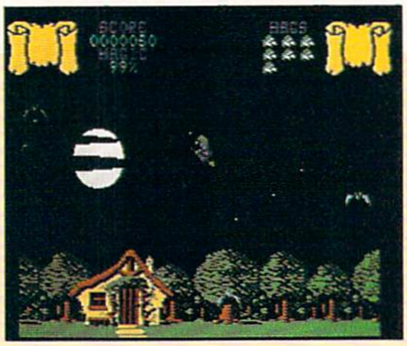
Cauldron

Computer: Commodore 64
Publisher: Broderbund
17 Paul Drive
San Rafael, CA 94093-2101
Medium: Disk
Price: $ 29.99

Bubble, bubble, toil and trouble. Come closer, Commodore players, and sample a delicious new dish being served up by the designers at Broderbund. They've taken one part adventure, two parts arcade, a healthy dash of novelty, and blended it all together in *Cauldron*, a temptingly fresh entertainment offering with a flavor all its own. This satisfying recipe first reaped praises in England, where it was introduced and quickly climbed to the top-seller status. Now it has finally arrived on our shelves, again promising to be nothing less than a lip-smacking success.

Cauldron is actually not one game but two: an acrade double feature containing both the original title and its related yet divergent sequel. Both challenges are structured around the antagonistic tension that has grown between the Witch Queen and the PumpKing, neighboring mortal enemies locked in an eternal power struggle over the land they share.

In the first contest, you step into the role of the Witch Queen, an enraged old sorceress who has just been victimized by a sweeper swiper. It seems that your orange archenemy, the PumpKing, has pilfered your precious golden broomstick, and is now keeping it under tight wraps in the far reaches of his secret subterranean lair. Physically, you are no match for the legions of muscle-brained guards surrounding your lost treasure. But your magic is strong, and after researching through your ancient potion index, you come across the exact concoction that will render the PumpKing and his followers powerless. The game itself now develops into a nationwide solo scavenger hunt, as you comb the chimerical countryside looking for the six scant and peculiar ingredients — eye of newt, juice of toad, etc. — that are to be mixed in the cauldron to prepare this mystical brew. On, over and under forests, mountains and seas you must search, all the while dodging a full assortment of enemy creatures who try to weaken you with their strength-sapping touch. It's a long, hard journey but an enjoyable one just the same.



Broderbund's taken one part adventure, two parts arcade, a healthy dash of novelty, and blended it all together in *Cauldron*.

The second game, a flip side follow-up entitled "The Pumpkin Strikes Back," picks up the action a few years later. As legend outlines, the Witch, after retrieving her golden broomstick, has risen to power and initiated a vengeful iron-fisted wave of terror aimed at eliminating all who oppose her. You, in an ironic role reversal, now take control of the PumpKing's last surviving guardian. Your mission: to single-handedly defeat the witch and restore your fallen leader to his rightful place of honor. Again, your attack will be carried out through the magical channels simmering in the all-powerful cauldron. The catch here is that the entire inventory of required secret potion items must be obtained from your enemy's castle, a heavily fortified citadel where the witch herself resides. So into the jaws of death you search, axing doors, skirting hallways and avoiding soldiers until you have gathered all the necessary ingredients. It's a demanding quest that will take timing, practice and ingenuity, to say nothing of a little luck.

The games, as described so far, would appear to be strict adventure contests. But I can assure you that these programs are arcade through and through, built on that high-velocity, quick-triggered foundation that all experienced joystick jockeys have come to embrace. The genre is also given a unique, almost whimsical twist, by the designers' choice of surrogate movement.

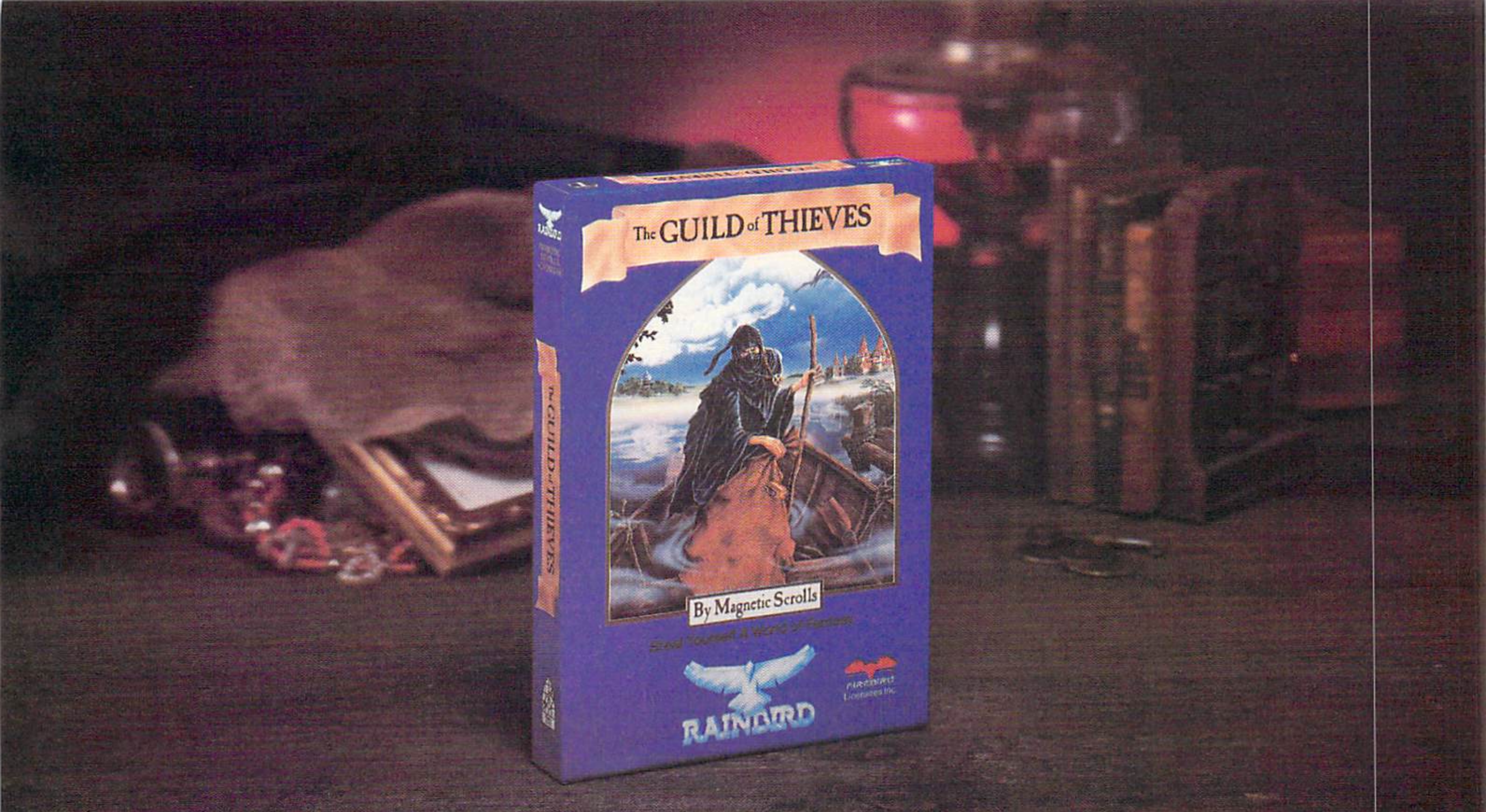
In *Cauldron I* your joystick-guided witch can either walk, jump, or take to the skies on the back of her broomstick. This latter, fairy-tale-familiar transportation choice, which will be the one most frequently accessed, demands some rather uncommon controller techniques to sustain flight. Unlike other arcade contests in which an on-screen airborne vehicle can instantly dart back and forth without regard to the laws of physics, your witch's cloud duster adheres to the principle of inertia, and will be required to first decelerate and stop before reversing direction. Carrying out evasive maneuvers and landing patterns will demand training and patience as you orient yourself to the feel of the ship.

In *Cauldron II* the strange gets stranger, for your pumpkin guardian, like the rest of his species, has no arms, legs, hands or feet. The only way he can move about is by bouncing. Talk about nerve-wracking! Where it would have been tough enough to sidestep the traps and terrors of the castle as a pedestrian, your jack-o-lantern character is forced to roam the witch's headquarters like some sort of overactive, smiling basketball, ricocheting off walls, thumping under tables and jouncing through the smallest of openings. Control will be difficult at first, but as you learn the unexpected and unusual tricks you can perform, this novel addition augments the game's addictive appeal.

Visually, *Cauldron* provides a crisp and colorful cartoon environment, with both stages combining the natural with the bizarre to create a dream-like, surrealistic atmosphere. The animation is fluid, with attention paid to even the smallest detail. The witch's clothes flap in the wind as she soars through the moonlit sky, gargoyles turn their granite heads to follow the path of your pumpkin, and fiery lava bubbles to the surface of overheating volcanic pools.

But as rich as this program's graphics are, this is not a contest that will allow for much sightseeing. In a word, this game is tough. You are given nine lives as a witch and six as a pumpkin. It will only take a novice a quick couple of minutes before he is dead and buried. Broderbund must have sensed the stiffness of the challenge, for they even included a set of maps that not only detail the worlds to be explored, but also pinpoint the exact location of all the necessary potion ingredients. Only the most seasoned arcaders will be able to make do without the extra help. For some of the inexperienced, knowing where the

Continued on pg. 105



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* (520ST Graphics)

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Reviewed by Jeffery Scott Hall

HardBall!

Computer: Amiga
Publisher: Accolade
20813 Stevens Creek Blvd.
Cupertino, CA 95014
Price: $ 44.95

HardBall! from Accolade is an arcade lover's baseball dream. This is one baseball game that has great digitalized sounds, music, speech and graphics. After the title screen, you select which device is plugged into port 1—mouse or joystick. Next choose your team—All-Stars or Champs, and whether you want to be the home team or the visitors. Finally, you may choose a one-player game, two-player game or a computer vs. computer game.

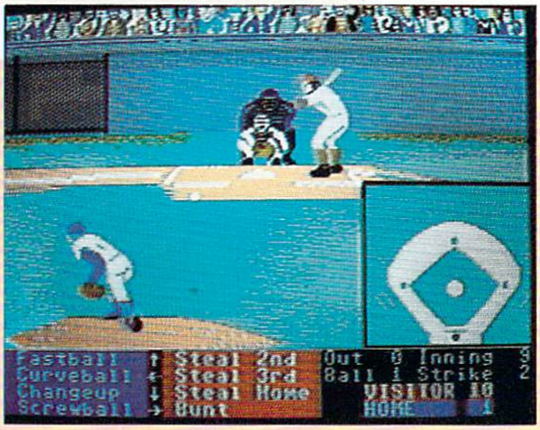
HardBall! has an on-the-diamond viewpoint which is very nicely done. The pitcher, batter, catcher, umpire and baseball are very lifelike. Your batter faces you and the pitcher has his back to you. Did I say that the baseball was lifelike? Yes, I especially like the baseball, it is very vividly done!

Batting is done very simply—press the fire button once to activate the batter each time you're ready for a pitch, and just push the joystick (or mouse) either up, down, left or right and push the fire button at the same time. The way you swing depends upon which way you think the ball will go. For example, if I pitch a curve ball left, then you should swing left. In a one-player game the computer will automatically activate his batter or pitcher, whichever the case may be. In a two-player game, pitching is done in almost the same way as batting.

To select the type of pitch you want, press the fire button with the stick held up, down, left or right. Note, the pitcher's options vary some according to who is pitching. For example, Tompkins has a good Fastball! pitch. You might be wondering about the difference between a "Fastball" and a "Fastball!" The latter has less salt and more pepper. Once you have selected the type of pitch, you may now pitch either up, down, left or right. Sound familiar? It's a lot harder than it sounds, you must remember that you have just selected the type of pitch which makes it much more complicated than just a simple pitch to the strike zones.

There's not too much to say about the catcher, except of course he catches the

In the dugout there's a teammate who blows blue bubble gum from time to time.



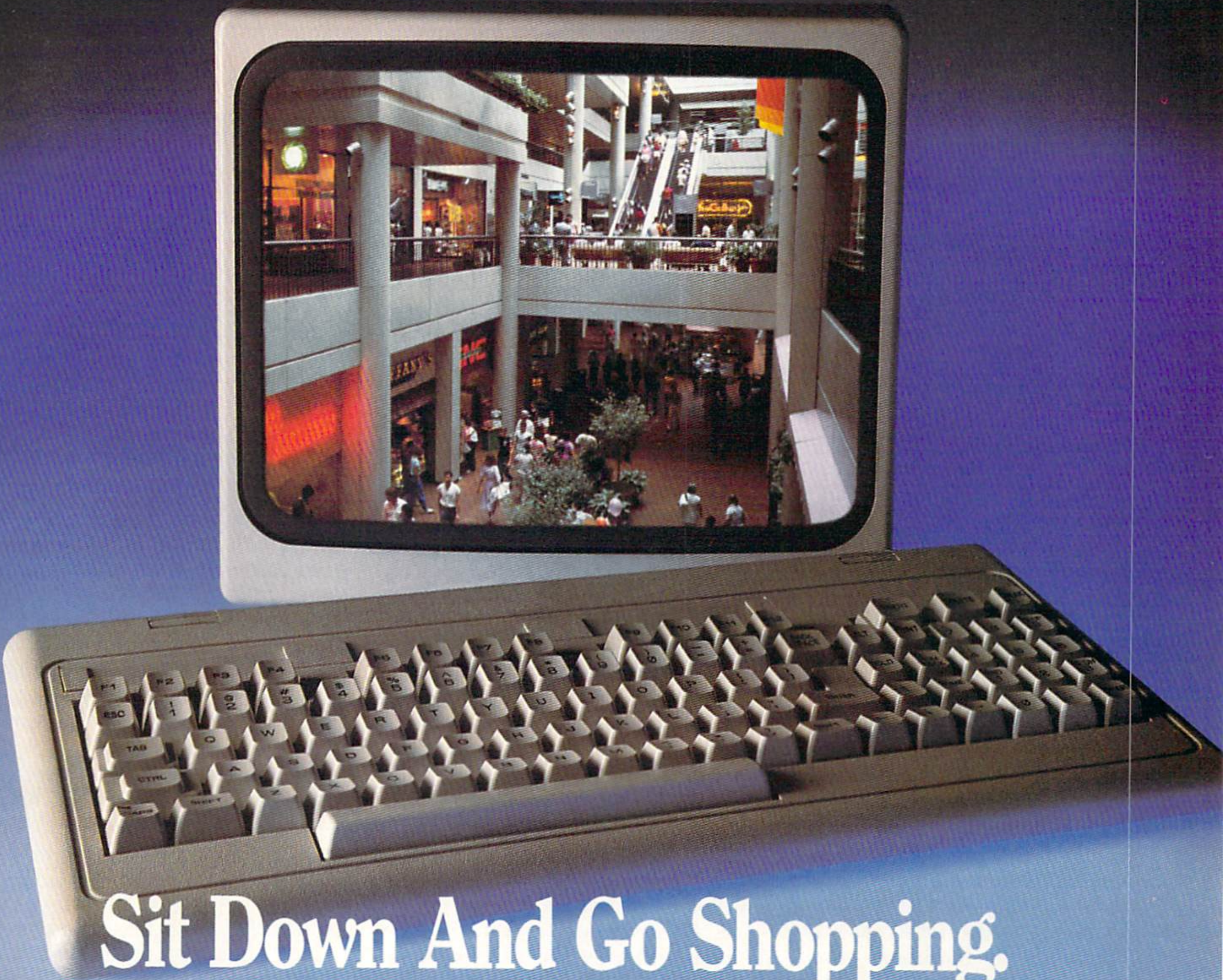
pitcher's balls. The umpire, on the other hand, has an added plus, he actually calls the strikes (not the balls), and has a realistic look to him. In the dugout there's a teammate who blows blue bubble gum from time to time. You may laugh, but this does add to the game, giving a more life-like feel.

Now that we've taken a good look at the players, let's look at the ballpark. A good looking ballpark is important in a baseball game, after all, that's where all the action takes place. When I play some computer baseball games it seems like I am looking at tiny pixels on the screen, like you would see if you were looking out of a blimp upon the stadium below. Baseball fans will not be disappointed with the stadium in *HardBall!* You can see *people* in the stands (not pixels) with different facial expressions. The green grass (or turf) is very distinguishable from the dirt. It is a nice shade of green, with good depth to it. Now, let's talk about dirt. How exciting is dirt, right? Well, if your dirt looks like grass, or tiny pixels, you don't have a realistic atmosphere. Again, *HardBall!* will not disappoint you. The dirt, well, looks like dirt. It all has a 3D aspect to it. When your base runner slides head first into third base, the dirt flies up around him—this is truly a plus for the game. Now that we have looked at the people in the stadium, grass and dirt, let's look at the structure of the ballpark itself. The stadium is done in a nice, light shade of blue. It has markers that are clearly distinguishable marking the 400 foot area (and others) and a nice 3D perspective. Wait until you hit that grand slam into deep center field. That will be one you won't forget for a while!

Has your pitcher grown tired? Has your center fielder missed that ball once too often? Has your shortstop stopped short? Then it is probably time you called in a (gasp) substitute. To call this screen up you simply press your space bar. A screen is displayed for both All-Stars and Champs with a list of every player currently in play, his name, batting average and position. To make a substitution you just move the joystick up or down to highlight the person you want, then press the fire button. Now a third window will open at the bottom of the screen displaying some players for your team. To scroll through them, press your joystick up or down. Each person's name, position and average are displayed in this window. Now you select the right player for the person being substituted. For example, let's say you're substituting a new player in the shortstop position. You scroll through your list until you find the shortstop you want. Then press your fire button. That's it, you have just substituted a player.

While playing the game, I found one small bug. I had a runner on second, two outs, one strike and three balls on the heavy hitter. I decided to bunt, and what a surprise I got! It just so happened that when I bunted, the ball fell short of where the third baseman could go. As a result, I got an in-the-park bunt homerun. However, at this point the game was hung up and I had to reset the machine. It would appear that the players are programmed to go only so far on the field toward the catcher. On the plus side, I re-created the same situation (and many others where I bunted) and cannot get it to happen again.

If you are a statistics fan and would like to create your own players and teams, this is not the game for you. However, if you love to play baseball and don't like to mess with stats, this is definitely what you're looking for. Great graphics, music, sound and speech combine to make *HardBall!* a grand slam.



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Reviewed by Graham Kinsey

Faery Tale Adventure

Computer: Amiga
Publisher: MicroIllusions
17408 Chatsworth Street
P.O. Box 3475
Granada Hills, CA 91344
Price: $ 49.95

The most unusual attribute in *Faery Tale* is luck — if your character has any left when he dies, a faery will appear and bring him back to life.



In *Faery Tale Adventure,* you are guiding three brothers in their attempt to retrieve a magical talisman that has been stolen from the village of Tambry where they live. Since the talisman's disappearance Tambry has been attacked by strange creatures, controlled by a powerful evil Necromancer. *Faery Tale* begins with oldest brother, Julian, standing in the middle of Tambry the morning after the attack.

The user interface for *Faery Tale* is a sort of "mini-menu," positioned in a portion of the bottom of the screen. The Items menu allows you to list all your items, search for hidden items or give an item you have to another person. The Magic menu allows you to use any magic item you have acquired during the game. The Talk menu is used for conversing with other characters. The Buy menu is used to purchase items in shops. The Game menu contains options for loading and saving a game in progress, plus options for pausing the game and options for turning off/on *Faery Tale*'s music or sound effects.

In addition to the mini-menu, there is also a compass that tells you what direction you are traveling. You can even click on one of the compass points to move your character if you are using the mouse. *Faery Tale* conveniently allows you to use mouse, joystick, or keyboard for virtually all choices and actions in the game. The information part of the screen also contains the narration scroll, which gives information on your character's status and actions. It also shows five numerical values that carry vital information about your character. Bravery measures each brother's combat effectiveness. Kindness has a major role in how effectively a brother will be able to communicate with other people (If this attribute drops very low, even the shopkeepers will refuse to do business with you!). The most unusual attribute in *Faery Tale* is luck. If your character has any luck left when he dies, a faery will appear and bring him back to life. She will then place him in the last "safe" spot he was located. Each brother has eight lives to "waste." One of the two remaining numerical values, vitality, is the equivalent of the famous "hit points" figure. The final figure is how much gold you are carrying.

The top two-thirds of the *Faery Tale* screen contains the view of your character and his surroundings. What a view it can be! All the people, objects and places in *Faery Tale* are represented in a 3D perspective from a top view. When outdoors, all objects cast shadows, which vary in intensity (but not in length) depending on the time of day. Outside light varies from a bright view during the day to a nearly pitch-black view in the evening. The natural scenery varies greatly, from gentle plains to mountains, from lakes to thick forests, from towering mountains to expansive deserts.

You will see animation and graphics during a fight that are so good that made many people compare *Faery Tale Adventure* to the extremely popular coin-op video game *Gauntlet.* While I wouldn't say that all of *Faery Tale* compares equally to *Gauntlet*, the combat sequences in *Faery Tale* come admirably close to the game that many youngsters spend dozens of quarters on.

Don't be too eager to explore every nook and cranny of Holm, for the nasties that ransacked your village last night are waiting for you! You are armed with a dagger at the beginning of *Faery Tale*, but this is no substitute for bravery and powerful magic. As a result, you will soon find out why each brother has many lives.

Fortunately you have several things that can help keep you from dying for good too quickly. Seven common magic items are found all over the place. There are glass vials to improve your vitality and jade skulls that can blast all attacking foes out of existence! There are also items that allow for better vision, speedy travel, and one that even temporarily stops time. All these common magic items work only once, but they can be found quite easily (especially if you can manage to take them from your foes). There are also different weapons that you can obtain. Four can be bought from any local merchant, although you have to be able to steal enough gold from your enemies in order to buy them in the first place (a real nasty catch-22).

You can use time to your advantage, too. When your character sleeps at night he will recover from a certain amount of damage received during the day. So even if you aren't lucky enough to find glass vials (or aren't rich enough to buy them at the shops), you do have a real chance to recover from your wounds, if you can just survive until sundown. If you refuse to allow the brothers to eat and sleep, they will collapse from starvation or exhaustion. However, with sustenance and rest the recovery is relatively quick.

The main task in *Faery Tale* is to retrieve the talisman from the clutches of the Necromancer. So, being a tireless explorer, you decide to check out every place in the land of Holm. However, you can't just barge into every castle, crypt or keep and interrogate its occupants or search every nook and cranny, because almost every place is locked! Even if you do find a key, how do you know it's the right one? There are six different colored keys in *Faery Tale,* and each only opens certain types

Continued on pg. 115

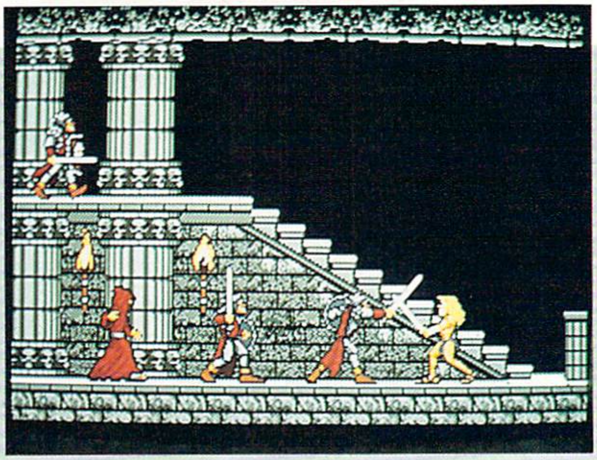

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Ultima V
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Screen displays shown from the Apple™. Others may vary. Allows the use of Ultima IV characters. No previous Ultima experience required.
ORIGIN SYSTEMS INC.
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Londonderry, NH 03053

Reviewed by Gary V. Fields

Barbarian

Computer: Amiga (512K Required)
Publisher: Psygnosis Ltd.
Distributed in U.S. by:
Computer Software Service
2150 Executive Drive
Addison, IL 60101
Price: $39.95

With jaw set, teeth exposed, long hair flapping and your father's sword in hand you begin.



Barbarian is a one-man search and destroy mission where you control Hegor the Barbarian. The object is to fight your way into the underground lair of evil Necron and destroy him, his power and Vulcuran the dragon which protects him.

The 14-page novelette which comes with the game explains that Necron is, in fact, Hegor's uncle. Before Hegor was born, his uncle and his father, Thoron had a parting of the ways. Thoron took the path of good, Necron the path of evil. Eventually Thoron killed Necron allowing the earth to take a deep breath of relief. But wait, evil won't be written out of the scheme of things so easily. Necron somehow resurrected himself, set up a kingdom down under and released his guardian dragon Vulcuran on the earth to settle the score with Hegor's father—which he does. As the dragon retreats to its lair, Hegor takes the broadsword from his dying father's hand and swears revenge. From youth to manhood he studies and trains until he is finally ready to set out on a quest to settle the score between good and evil.

That's where you come in. Clad only in loincloth, wrist armor and sandals you face the marshes which lead to the opening into Necron's domain. With jaw set, teeth exposed, long hair flapping and your father's sword in hand you begin. It doesn't take more than a few steps to discover that there are more evils in this land than Necron and his dragon. Each step reveals new dangers, both breathing and mechanical. *Barbarian* creates an unearthly world where few of the creatures you encounter will look or react like anything you have seen before. The first guardian you must outmaneuver or fillet is a two-legged, evil-faced, rubber-kneed brute which is more teeth than anything else. Next you must jump past a trapped archway, slash through a fur-coated, animated claw-and-jaw of destruction, dodge a demon, disperse a ghoul, retrieve an arrow. Only after all that are you ready to begin your descent into Necron's private hell—a catacomb carved out of a living volcano. This is where things really get tough.

The game looks and plays like an expensive arcade but is actually a mixture of both arcade and graphic adventure. Rather than having to eliminate every opponent you may, providing your reflexes are well tuned, sidestep them. Although a joystick can be used, mouse or keyboard input is more effective. The game's unique interface devotes the lower 1/5 of the screen to a row of ten large icons. To get Hegor to move right you click on the right arrow, to get him to climb you activate the up arrow, to fight you click on the sword symbol, etc. These ten command icons, plus an additional row of less-used commands let you rapidly issue commands for Hegor to run or walk left, right, up and down plus stop, jump, defend himself, flee, pick up objects and switch weapons.

Barbarian's graphics are as good as I've seen anywhere—that includes dedicated arcade machines which you must pop quarters into. Hegor is proportionally sized to his surroundings, his body is shaded to reveal form, muscles, joints and even the direction of the light falling on him. The bad guys and creatures you'll encounter are just as well defined. (Note: if *Barbarian* were rated it would get at least a PG-13 because of the abundance of graphic violence.)

Happily, the excellent graphics are not paid for at the expense of animation. The first animated screen displayed when the game loads shows a wonderfully realistic, detailed Hegor with a body as large and muscular as any boxer from a *Rocky* movie. The character comes to life, lifts a huge sword, his face grimaces and twitches and then with a great effort he raises the sword. The screen flashes and the speakers clatter as the sword falls and severs the chain holding Hegor.

The documentation doesn't mention how the sound effects of *Barbarian* were created, but they sound like digitized effects from real life. When Hegor is injured his moans sound real and when he thrusts his sword the grunt which accompanies the action is of a man exerting effort.

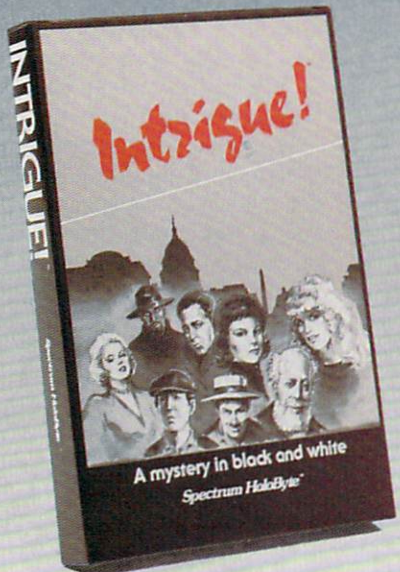
Barbarian is a tough, challenging game. Each time you begin the quest, the opponents you face are almost always the same, although some small details randomly change (the tree demon doesn't always throw rocks, for example). Since there is no way to save your position in the game, each time Hegor dies you must face them again. This means your memory of which opponent is next and where snares are hidden is paramount. This also leads to some frustration since you can spend hours battling and memorizing the first five or six levels of *Barbarian* and will still be only 15-20% of the way through the game. Because the game is so well designed and each turn in the cavern opens up new visual delights, being denied seeing those is irritating.

One other thing: fighting your way to Necron's lair, destroying the crystal of evil and conquering all his evil defenders isn't enough. After all that effort, you still have to get back to the surface and the marshes

Continued on pg. 115

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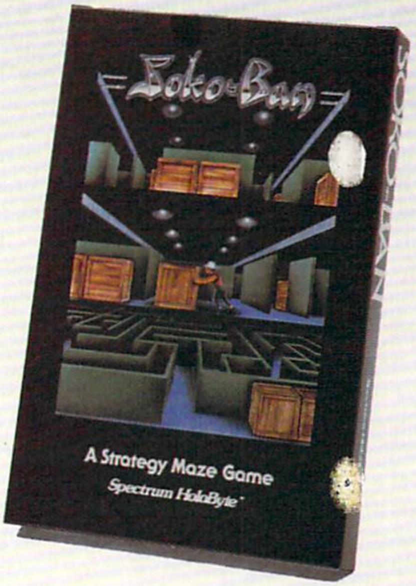
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IBM Version

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Reviewed by Bob Lindstrom

Animator: Apprentice

Computer: Amiga (1 MB Required)
Publisher: Hash Enterprises
14201 S.E. 16th Circle
Vancouver, WA 98684
Price: $ 295.00

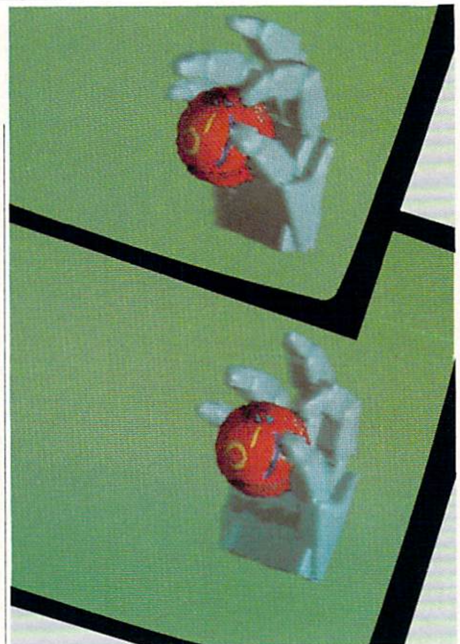
Animator: Apprentice is a new Amiga animation program that specializes in character animation. It won't duplicate the "squash and stretch" genius that made Disney great—even the Amiga can't yet capture the organic illusion of life achieved by professional animators. However, *Animator: Apprentice* makes a potent attempt by providing the tools to make your own cartoons, the power to design, animate and direct your own Daffys, Dumbos and Dopeys.

Animator: Apprentice consists of seven program modules: The Character module is for the construction of the skeletal stick figures that will be your characters. The Sculpt module puts flesh on those bones by allowing the sculpture and painting of 3D body parts. The Action module is where characters are animated. The Director module is a scene editor that provides a computerized stage where the animator assembles and directs his "actors" and plots camera angles and movement. The Rehearsal module previews scenes in real-time, with stick figure animation, and the Display module plays it back.

Finally, the Record module brings together all the data from all the modules and draws (renders) the final product as either compressed graphics files or IFF-compatible graphics files (with frames that can be edited individually with *Aegis Images* or *DeluxePaint*).

Also included in the three-disk package are a matte disk containing sample characters and a data disk with examples of animation and scene editing.

Animator: Apprentice requires an Amiga running Kickstart 1.2, 512K of internal RAM and at least 512K of external RAM. Hash Enterprises also plans to publish *Animator Jr.*, a consumer version of the product incorporating only some of the *Animator: Apprentice* features for under $80. Additional data disks of characters and animation for use within the program are also scheduled for release.



Hurl by Daniel Wile

Suddenly, the work of animation becomes very time-efficient.

Before describing *Animator: Apprentice's* seven modules, here's how conventional animation works:

Although Saturday morning cartoons look like continuous movement, they actually consist of thousands of still pictures flashed quickly before your eyes. Because of a peculiarity of human vision, these sequences of rapid-fire "snapshots" blur together into fluid motion.

Conventional animation artists meticulously draw each new image. The process is repetitive, time-consuming and contains a large helping of the kind of tedium that a computer takes in stride.

Animator: Apprentice is programmed to reduce that tedium. Just load the Action module of *Animator: Apprentice* and choose a character design. A stick figure of the character appears on the screen. Let's say we've chosen a little man and we're going to make him scratch his head.

Animating the figure is like manipulating an on-screen doll with moveable joints. Use the mouse to move the doll's arms, hands, legs and head into the starting position. In this case, standing still with his arms at his sides. Then use the mouse to "grab" his hand and put it on top of his head. Because the arm and shoulder are attached, they follow the movement automatically. That's the final position.

Then select, say, 30 frames to get from the starting position to the final position. The computer jumps in to do the grunt work, calculating the 28 drawings that will go between the beginning and ending positions.

Now we can Audition the action in real time. After a moment's pause for calculation, the stick figure springs to life in smooth, fast animation. The instant feedback is very satisfying.

The whole process seems simple and, relatively speaking, it is. However, the Action module gets complicated as the animation gets complicated. Animating a basic walk, for instance, requires careful positioning of each hand, forearm, shoulder, the head, the legs, the feet and coordinating all those movements down to the individual frame.

Once the animation is outlined (to use animation jargon) by these "key" frames, the computer will fill in the gaps with the "tweens" or in-between drawings. And the entire sequence of movement can be saved to disk and reused by every other character in your disk file of characters. *Animator: Apprentice* automatically customizes the movement to suit the skeletal structure of each character. Suddenly, the work of animation becomes very time-efficient.

The Director module operates in a similar fashion. You load a cast of characters from disk and position symbols to show the characters' location on the on-screen "stage." The Director module also includes the option to tilt or swivel the characters in any direction and the ability to designate camera angles and camera movements during a scene. Additionally, you can locate and move the light source and control the amount of direct and ambient light in their computerized environment. In a very real sense, *Animator: Apprentice* is like having your own stop-action studio with total control over animation, camera and lighting.

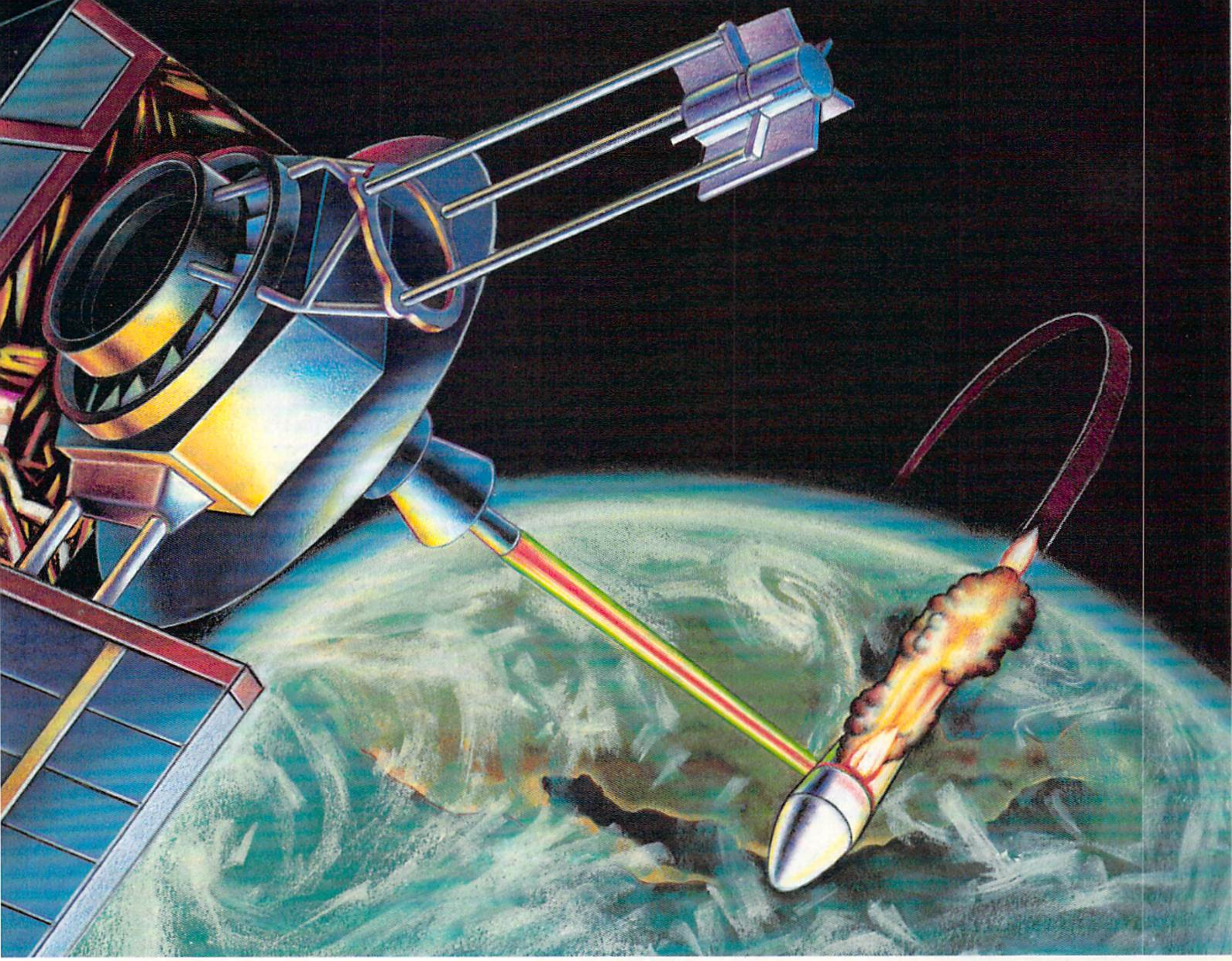
The Action and Director modules provide many more capabilities than those described here. The computer can account for momentum—speeding up a body part at the beginning of a move and slowing down at its end. Action can be stepped one frame at a time. And much more.

The Character and Sculpt modules are among the most powerful and the most difficult of *Animator: Apprentice's* tools. In the Character module, the animator creates a diagram of Bone Boxes, a sort of organic flow chart that shows how a character's "leg bone's connected to the knee

Continued on pg. 44

SAVING THE HUMAN RACE CAN BE VERY ENTERTAINING.

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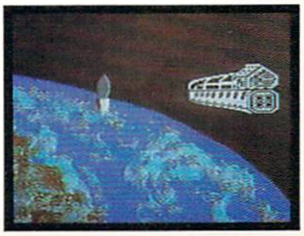


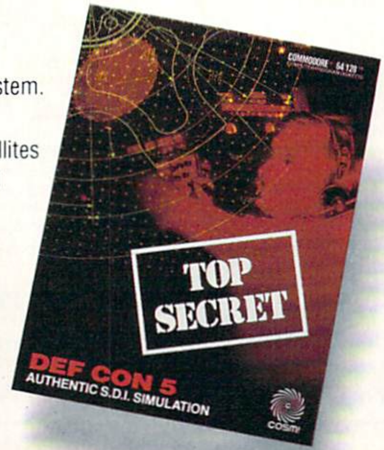
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Animator: Apprentice

Continued from pg. 42

bone." This chart records the size, length and position of each body part and how it hinges to the other parts, whether it swivels or pivots or swings wide. Every part of a character that will be animated must be described here as a Bone Box from eyelid to ankle.

Though the example characters all are humanoid, two-footed characters, the Character module provides the freedom to design any kind of weird being and then edit or alter it to create new, even weirder beings. How about a Saturday cartoon about two-headed, six-legged zombies whose mouths are on the soles of their feet? Do it.

Fortunately, everything can be saved to disk to generate a growing library of parts. Just as individual animations and scenes could be saved in the Action and Director modules, the Character and Sculpt modules provide the ability to save character designs, sculpted body parts and final, fully-detailed characters. With a sizeable library of your own creation, it's a simple matter to mix and match character skeletons, body parts, animations and scenes.

The Record module asks if you want to test your work by previewing individual frames or if you want to render an entire scene and save it to disk. If you choose to direct the images to disk, you have the choice of a packed format which allows more images per blank disk or IFF format that can be touched-up with *DeluxePaint* or *Aegis Images*.

> *Animator: Apprentice* is like having your own stop-action studio with total control over animation, camera and lighting.

Identify the Director file that contains the desired staging. Enter the range of frames that you wish to create during this session. (You might have to split long animations between several disks.) Decide whether you want realistic 3D shading or flat cartoonish lighting.

Then take a vacation.

The computer may take from five to 20 minutes to draw one frame. Even simple reckoning reveals that rendering the final artwork is an overnight job at least. My Amiga labored for 12 hours on 70 frames of a 120-frame animation before it ran out of disk space. Sadly, there is no way to determine in advance how many of your frames will fit on a disk. Happily, it is possible to recover a partially completed animation and start the computer drawing again from that endpoint. Hash is currently working on a more efficient solution to the disk space problem.

The final product is worth the wait — smooth, dimensional, computerized, 3D character animation in all its glory. When the finest quality is required, it is best to generate IFF files instead of packed disk files.

Hash is constantly revising and enhancing *Animator: Apprentice* and typically makes program upgrades available for little more than the cost of disks and postage. There is also a newsletter to keep users abreast of the latest versions and achievements with the program.

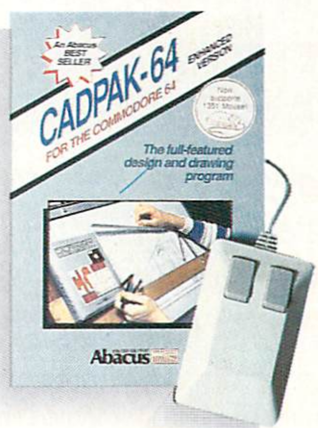
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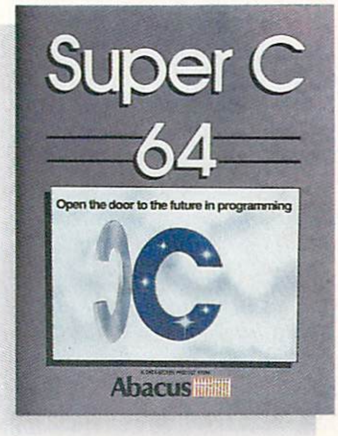
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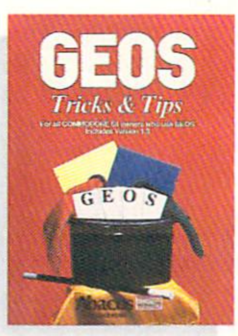


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Reviewed by Graham Kinsey

Online! 2.0

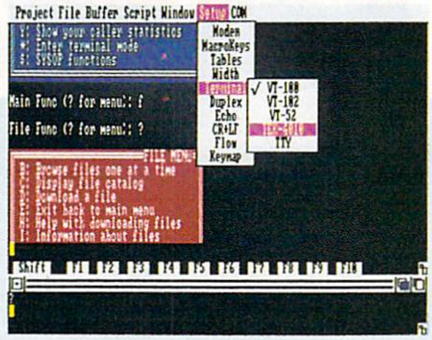
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When the Amiga was very young and its software base was very small, there appeared a terminal program called *Online!* When it first came out *Online!* was applauded for its features, which included a huge menu set, macros, script files, multitasking support, VT-100 emulation, and Xmodem and HVP protocols. As time passed, the Amiga software market grew tremendously, and the Amiga telecommunications realm was constantly changing, but *Online!* didn't keep up with the market. As a result, *Online!* went from the best Amiga telecommunications program, to just a good one, to just another Amiga terminal program. Then several public domain/shareware Amiga terminal programs appeared (first Starterm, then Comm and AMIC) which started to embarrass *Online!* as well.

Finally, *Online!* has been upgraded to version 2.0, and this terminal program has risen from near the grave to climb back to the top of the heap of Amiga telecommunications programs.

Four new transfer protocols are one significant improvement in *Online! 2.0*. Kermit, which is the standard protocol for transfer between mainframes and remote terminals, is now quite common in the Amiga terminal world. On the other hand, the other new protocols in *Online!* have not yet appeared in any other Amiga terminal program, commercial or PD.

The first is Ymodem, an improved version of Xmodem. The difference between Ymodem and standard Xmodem is that while Xmodem transfers in 128-byte blocks, Ymodem blocks are 1024 bytes in size. The original version of *Online!* contained a protocol called HVP (Hayes Verification Protocol), which also transferred data in block sizes of 1024 bytes; but HVP became rather unpopular with *Online!* owners (due to reliability problems), and has been removed in favor of Ymodem. Assuming your transfer has few naks (errors, which are usually associated with line noise), increasing the block size can significantly reduce the amount of transfer time due to error checking. For example, when I perform file transfers on a local BBS that runs *PC-Board* (an MS-DOS BBS program), using Xmodem-CRC protocol at 2400 bps, I usually average 165 cps (characters per second). File transfers under identical conditions, are throughput at a rate of about 210 cps using Ymodem (a 27% increase).



Finally, *Online!* has been upgraded to version 2.0, and this terminal program has risen from near the grave . . .

In addition to standard Ymodem, *Online!* also provides Ymodem-batch, which allows you to transfer multiple files in one continuous file transfer.

The last new protocol in *Online!* is Zmodem, yet another improvement for Xmodem. Zmodem has two main improvements over Xmodem and Ymodem. First, Zmodem implements sliding windows, which can effectively reduce or even eliminate the delay caused by accessing a BBS or on-line service via a packet-switching network, like PC-Persuit, Telenet or Tymnet. Secondly, Zmodem is far superior in detecting errors during a file transfer. Zmodem is also a very stable protocol, in that it has a better chance of surviving a shot of severe line noise that might cause other protocols fatal problems.

A new feature in *Online!* is that you can now tell *Online!* to automatically redial a busy number. You can also tell it to dial more than one number at once. *Online!* will even let you set up a queue, so that you can tell it which numbers to try first. It will normally dial each number only once, before moving on to the next number, but you can force it to redial a number by selecting that number more than once in a queue.

Another major change in *Online! 2.0* is the graphics and text display. There are two additions to the terminal emulation part of the program. Tektronix 4010 emulation capability has been added. Tektronix terminals display high resolution color graphics and sell for thousands of dollars each. At the moment, the Amiga is the only microcomputer under $5000 that can actually emulate a Textronix 4010 display without costly graphics add-on boards, or gimmicky scrolling tricks in order to view the full Tektronix screen. The other addition is that *Online!* can now fully support color ANSI displays, like those you often see when you call many bulletin boards that run MS-DOS BBS programs like *PC-Board*, *RBBS* and *Opus*. In addition to being able to display all eight colors (which many Amiga terminal programs can now do), *Online!* supports all ANSI color commands, including the infamous clear screen command. (I have seen no other Amiga terminal program that can handle all ANSI commands.) Supporting ANSI color doesn't make much sense if you don't also support the IBM character set in order to display all those IBM character graphics symbols. *Online!* has the IBM 8X8 font included on its system disk and now uses the IBM font as its default font. *Online!* also allows you to choose from four different font sizes at any time, even while it's running. One of these new font sizes, the 5X8 font, allows you to display 132 columns within a normal sized screen. However, if you want to display more than 80 columns (or more than 24 rows) without having to use a tiny font, then *Online!* can accommodate you also. *Online!* can now enlarge its display to take advantage of the overscan area of your monitor, if you have previously run a program that allows you to use display in the overscan area. (Refer to MoreRows and ScnSizer, reviewed in the November and December installments, respectively, of my Amiga Public Domain column in *Commodore Magazine*).

Another important change to *Online!* has to do with binary file transfer. Previously, *Online!* did not utilize any buffer for storing data while the binary transfer was taking place. Instead, during a binary file transfer, *Online!* just read or wrote to the disk each time it had to read or write a 512-byte block of data. Fortunately, this ghastly problem has been rectified. *Online!* now utilizes a 16K buffer for binary transfers, which is quite reasonable.

Online! was formerly unable to keep up with 2400 baud in terms of screen I/O.

Continued on pg. 117



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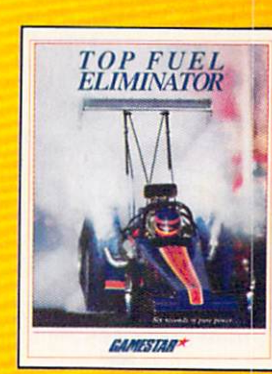
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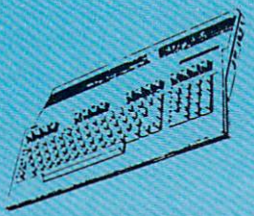
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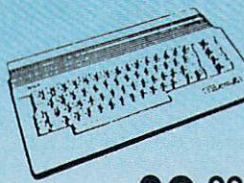
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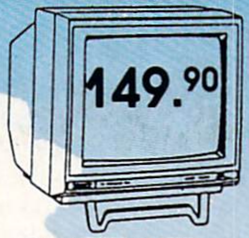
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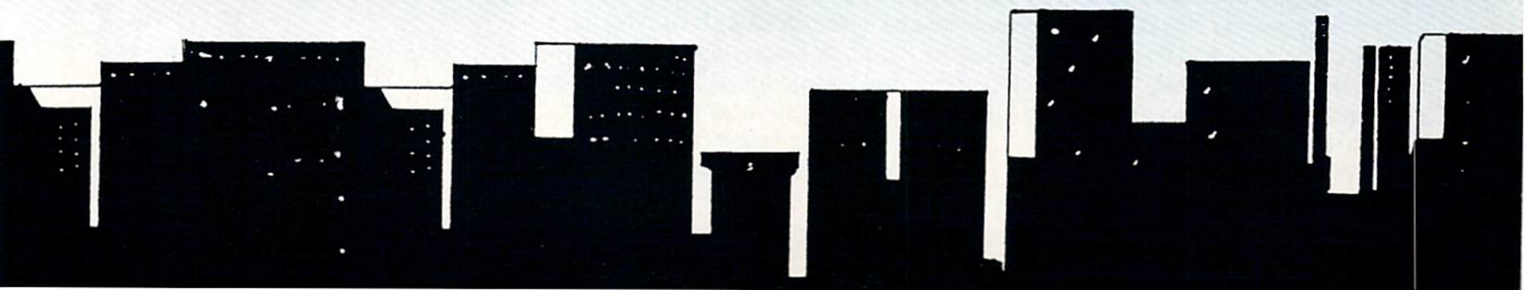
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by Marshall Freedland and Luis Garcia

Fastload Switch

Turn Your Fastload On and Off With This Easy To Install Switch

I still had my 64 when I first bought my Fastload cartridge and it really was worth the investment; it did the job but there were "problems." I had to disable it to run some programs, but that was simple. I just pressed the English "POUNDS" key to switch onto the menu screen and then "D" to disable the cartridge. But there was the occasional annoyance of having to actually physically *remove* the cartridge in order to run some heavily protected software because it seemed, for some reason, just disabling did not always work. Still, I was able to live with that. My worst fear was that I would, at some point, absentmindedly forget and either remove or install the cartridge *while the power was on,* potentially destroying the cartridge and causing very serious damage to the computer. Fortunately that never happened. Then I bought my 128. I found I was not only spending much more time removing and inserting the cartridge in order to switch back and forth from the 64 mode to 128, but I was also beginning to cause significant wear and tear on the cartridge, the computer connectors and my nerves. Needless to say, my fear about forgetting to turn off the computer when I was inserting or removing the cartridge was compounded now that I was doing this more often. It was time to come up with a better solution. Because of the limited space on my desk there was not enough room behind my computer to install one of those multi-cartridge loaders I'd seen advertised. The cartridges are installed vertically and the placement of my monitor would not allow for this. When I explained my dilemma to my friend Luis, he said, "No problem, we'll put in a switch."

If you follow along with the instructions you should have no trouble installing this small switch in your Fastload cartridge. This whole project should take you no longer than an hour, and upon completion it should save you time, wear and tear, and eliminate the fear and worry of accidentally ruining your cartridge (or computer). You should be forewarned that by



Photo 1

installing the switch you are in effect voiding any warranty. Also, those who attempt this project should have some familiarity with soldering. You will need the following parts and tools (Photo 1):

A small screwdriver
A phillips screwdriver
Three inches of double stranded wire
A soldering iron and solder
A small SPST switch (Radio Shack #275-645. Cost: approximately $1.49)
A sharp knife
A 13/64 drill bit and drill

Getting Started

1) The first step is getting the cartridge open. This is done by locating the small phillips screw that holds the two sides of the cartridge together. It is located in the center of the cartridge and near the bottom of the letter "a" in "Fast." Take the knife and, starting near the bottom of the letter "a," gently cut around the screwhead. If you desire, you can re-glue this small piece later, so be careful removing it. Remove the phillips screw and set it aside for later assembly. Next, make a cut along the paper in the rear of the cartridge following the seam already in the cartridge.

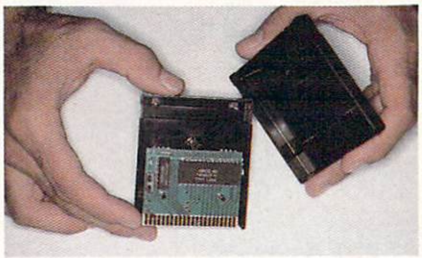


Photo 2

2) With the screw removed and the paper label slit, grasp the cartridge at the sides and at the opening and *gently* pull it apart. This may be the most difficult part of the whole procedure, so *be careful not to crack the plastic case as you apply even pressure.* You may need to use a regular screwdriver to help start and to pry apart the two sections. As you begin to open it up, it is important to *keep the separation even all around.* (Photo 2.)

3) When the cartridge is apart, set the part with the electronic components aside. The other section is where the switch is going to be mounted, but first you have to locate where the hole is to be drilled. I drilled just between and below the "P" and the "Y" in EPYX, above the "a" in "Fast." You have some options here *as long as there is room below for the switch in the cartridge when it is closed.* Carefully drill the hole where you have decided you want it. The next step is soldering the wires to the switch. Prepare the wires by stripping away about 1/4 inch of the insulation and then tin all four ends and the two poles on the switch. (This entails coating them all with a small amount of solder.) Then carefully solder two wire ends to the two poles on the switch. Make sure they are not shorted.

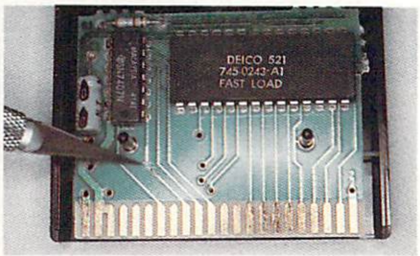


Photo 3

4) After the wires are soldered to the switch, locate the ninth position edge connector. Now, carefully cut the trace. Basically what you are going to do is place a switch across this cut. Make sure there is a small but definite separation. Now, scrape away just a little of the solder mask on each side of the cut on the trace. Take the soldering iron and tin the areas you just scraped *making sure NOT to apply too much heat. Just a small amount of solder is all you will need. Work quickly so the heat does not build up.* (Photo 3.)

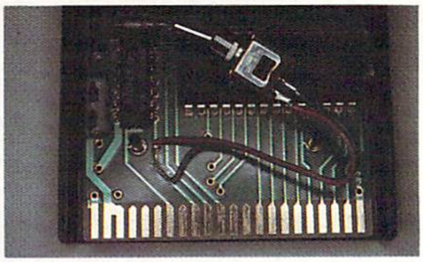


Photo 4

Continued on pg. 52

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(IBM screen shown. Actual screens may vary.)



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Continued from pg. 50

My friend said, "No problem, we'll put in a switch."

5) Take ends of the wires that you have already soldered to the switch and gently solder each end to the scraped and tinned trace. It is not critical which wire is soldered to which side, but be very careful not to apply too much heat. Just a little should do the trick. (Photo 4.)



Photo 5

6) After you have soldered the wires from the switch to the trace, you must cut a small notch on the rib of the top section of the cartridge. Use your knift to *cut away just enough so that the wires will not be crimped when the cartridge is back together.* Now insert the switch in the hole and then screw in and tighten the retaining nut on top of the cartridge.

7) Re-assemble the cartridge by gently squeezing it back together and replace the phillips screw. (Photo 5.) Now install it in the slot in your 128 or 64 (Make sure it is turned off!) Turn on the computer. If nothing happened, the switch is in the OFF position. Turn off the computer, switch the switch, and turn on the computer again. You should now see the familiar Fastload message on your screen. If you *didn't* get these results, it will be necessary for you to go back and re-check each step of the instructions to find where you made a mistake. Check for shorted wires and bad (cold) solder joints. If all worked well, it will not be necessary to remove this cartridge again unless you need to install a different cartridge. Changing the switch while you are in either the 64 or 128 mode will have no effect at all. To use the switch you must turn the computer off (or use the reset button) and choose one of your options: Fastload on—(or off) in 64 mode by holding the COMMODORE key; or Fastload off to access the 128 mode. If you like, you can affix a label on your 128 to indicate which direction the switch should be for a specific function. ■

Continued from pg. 30

draulic whine of loader arms doing battle with the alien queen. Every game has its own group of sounds, each noise supporting the action on the screen effectively.

In conclusion, *Aliens* is a unique program for several reasons. First, it recreates key scenes from the movie of the same title and dares you to walk a mile in the shoes of a Colonial Marine. Six tough assignments will test your powers of observation, while putting you on the spot to make quick decisions at a moment's notice. Good graphics, special music, and a number of interesting sounds were also added to the scheme of things. The final result is a superior product which simultaneously challenges and entertains the person behind the joystick. If you have the guts to pilot a drop-ship, call the shots for a marine unit and wage a private war against an intelligent creature from another world, *Aliens* is definitely your cup of tea.

I had the chance to talk briefly with Steve Cartwright, the leader of the *Aliens* design team. Here are some of his thoughts and some tips for playing the game.

Jermaine: What led to the development of *Aliens*?

Cartwright: Believe it or not, Activision owned the software rights to *Aliens* a year before the movie appeared in theaters. However, the in-house programmers, artists and game designers knew nothing about that arrangement. After seeing *Aliens* one afternoon, we all left the theater with the same idea: *Aliens* would be the perfect subject for a computer game. The next day I brought up the idea and found out that Activision already owned the rights to that particular property.

Jermaine: Can you tell me more about the early days of the project?

Cartwright: We planned out the entire program in fifteen minutes. It was just a matter of analyzing the movie, breaking it down into key scenes, and coming up with a game concept which recreates each particular situation.

The games were designed to share a common quality. When you participate in an *Aliens* challenge, your fate is truly in your own hands. Each game is a tough little assignment where experience is the best teacher. You can play to win or experiment with different ideas, but you can't blame the failure on random events or bad luck. These factors simply don't exist.

Jermaine: Did 20th Century Fox ask you to make many changes in the finished program?

Cartwright: There were some minor problems alright, but nothing we couldn't take care of right away. Twentieth Century Fox was very concerned about the fact that our transitional scenes contained direct quotes from the shooting script. I was led to believe that Activision might have to pay for the privilege of using that material in the program. Thank goodness our legal people investigated the situation and said everything was fine.

Another problem concerned the fact that you couldn't say the aliens were killing people. They were actually capturing human beings for later use (which would be the cause of their death). We also had to use the correct terminology for everything. You couldn't talk about a small alien creature crawling around on the floor. These little devils are called "Face Huggers." In short, the owners of the license were concerned about legal technicalities, correct terminology, and "good taste" at this time. We had kept in close contact with 20th Century Fox throughout the making of the program, so they knew all about the games and really liked the finished product.

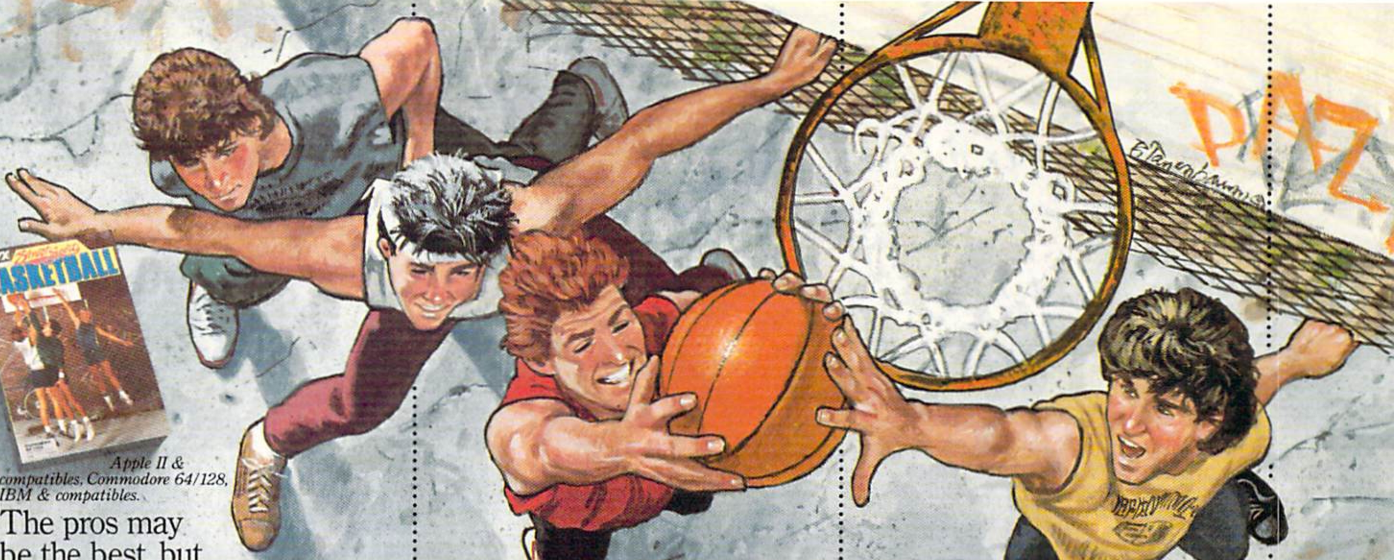
Jermaine: Would you share some tips for playing *Aliens*?

Cartwright: The Armored Personnel Carrier is always located in the same corner of the building. Learn to move the marines in that direction and you'll eventually find it.

There are two basic rules to follow when you use the flame thrower: (1) destroy the fast-moving aliens by shooting blasts of fire in their direction and (2) use the flame of the weapon to back off slow-moving creatures.

The Newt Rescue Race is a race against time, where Ripley must conserve her ammunition in order to survive. When you confront the alien queen in the nest area, shoot at the nest, and the queen will move over to protect the eggs. Now is your chance to slip by her in the confusion and proceed to the elevator.

The best strategy in the One-On-One Confrontation is to keep hitting the queen with the power loader claws until she weakens substantially. While this boxing match is going on, the claws should also be used to keep the alien at bay. At the proper moment, grab the creature from below and eject it from the ship. One more thing—don't make your move on the alien queen too early in the battle. ■



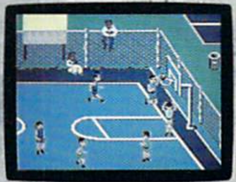
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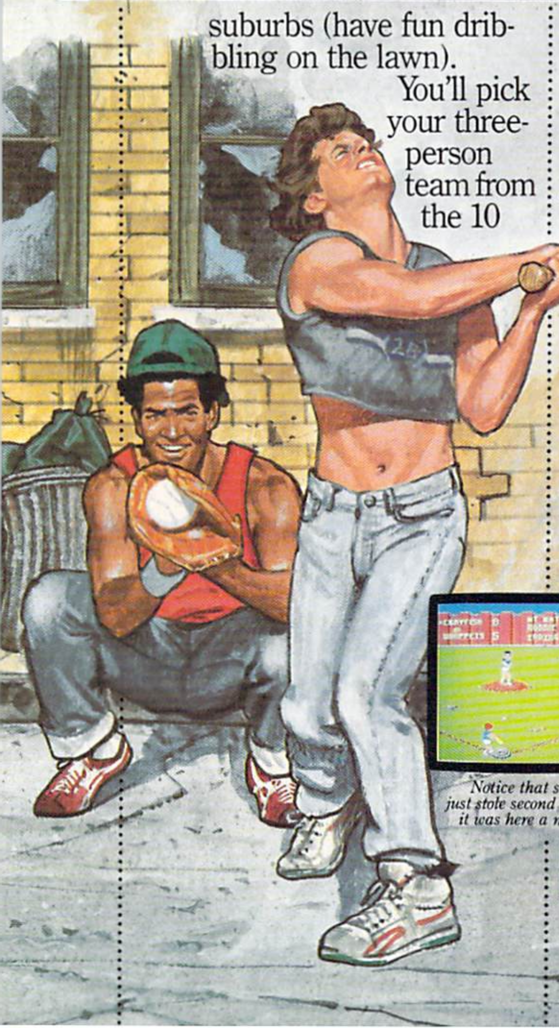
It's not going to be as simple as you thought to be the first on your block.

After all, you'll have to cope with makeshift diamonds, bases made from spare tires and trashcans, bushes, rocks, even squealing cars.

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It won't be easy. But it's right up your alley. **EPYX**


Notice that somebody just stole second base. Funny, it was here a minute ago.



Apple II & compatibles, Commodore 64/128, IBM & compatibles.

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ED'S WEEKLY

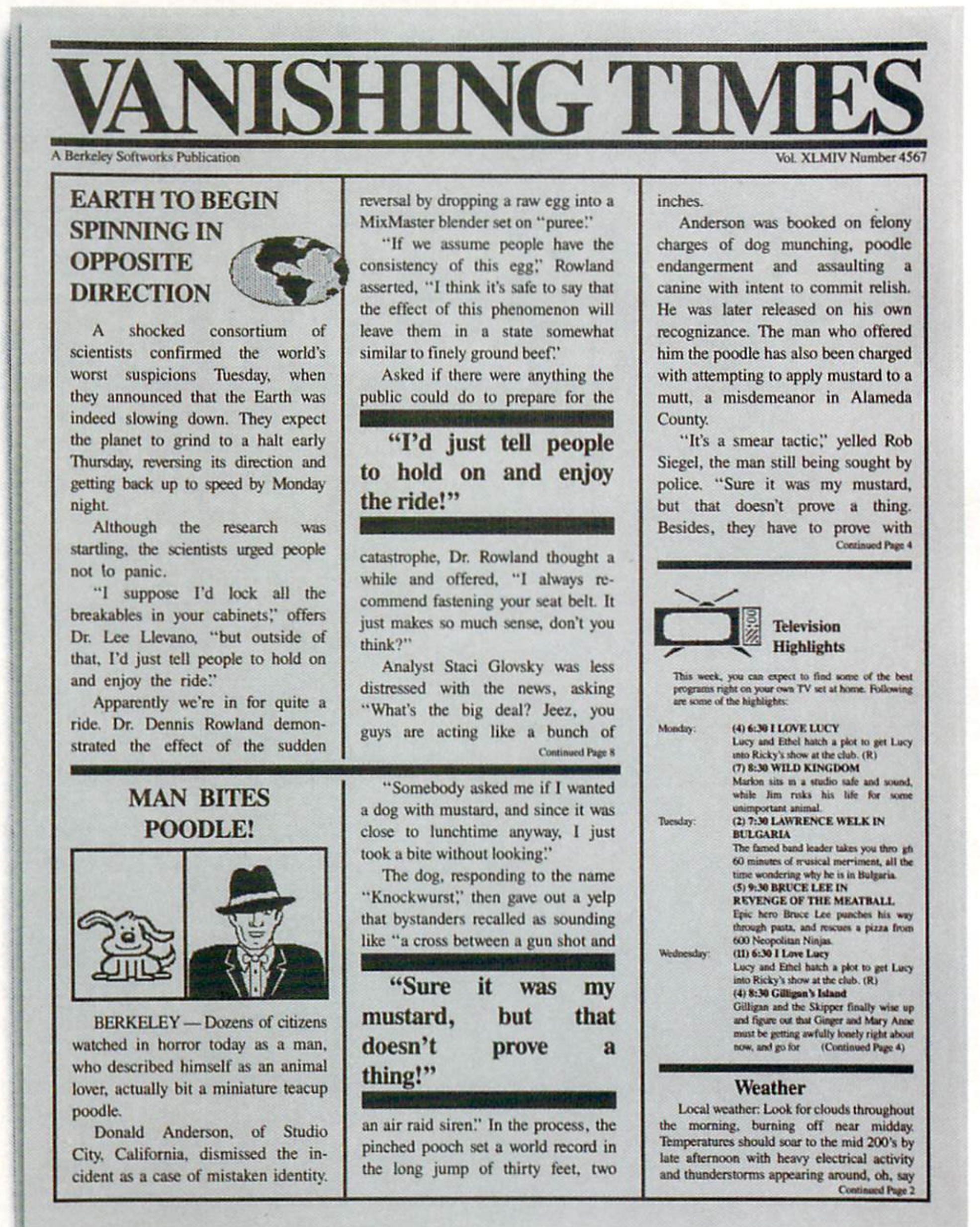
The views and news of Ed.

December 3

Basquing In The Beauty of Andorra

Weather

More people reading stuff like this!



VANISHING TIMES

A Berkeley Softworks Publication — Vol. XLMIV Number 4567

EARTH TO BEGIN SPINNING IN OPPOSITE DIRECTION

A shocked consortium of scientists confirmed the world's worst suspicions Tuesday, when they announced that the Earth was indeed slowing down. They expect the planet to grind to a halt early Thursday, reversing its direction and getting back up to speed by Monday night.

Although the research was startling, the scientists urged people not to panic.

"I suppose I'd lock all the breakables in your cabinets," offers Dr. Lee Llevano, "but outside of that, I'd just tell people to hold on and enjoy the ride."

Apparently we're in for quite a ride. Dr. Dennis Rowland demonstrated the effect of the sudden reversal by dropping a raw egg into a MixMaster blender set on "puree."

"If we assume people have the consistency of this egg," Rowland asserted, "I think it's safe to say that the effect of this phenomenon will leave them in a state somewhat similar to finely ground beef."

Asked if there were anything the public could do to prepare for the

"I'd just tell people to hold on and enjoy the ride!"

catastrophe, Dr. Rowland thought a while and offered, "I always recommend fastening your seat belt. It just makes so much sense, don't you think?"

Analyst Staci Glovsky was less distressed with the news, asking "What's the big deal? Jeez, you guys are acting like a bunch of

Continued Page 8

MAN BITES POODLE!

BERKELEY — Dozens of citizens watched in horror today as a man, who described himself as an animal lover, actually bit a miniature teacup poodle.

Donald Anderson, of Studio City, California, dismissed the incident as a case of mistaken identity.

"Somebody asked me if I wanted a dog with mustard, and since it was close to lunchtime anyway, I just took a bite without looking."

The dog, responding to the name "Knockwurst," then gave out a yelp that bystanders recalled as sounding like "a cross between a gun shot and

"Sure it was my mustard, but that doesn't prove a thing!"

an air raid siren." In the process, the pinched pooch set a world record in the long jump of thirty feet, two inches.

Anderson was booked on felony charges of dog munching, poodle endangerment and assaulting a canine with intent to commit relish. He was later released on his own recognizance. The man who offered him the poodle has also been charged with attempting to apply mustard to a mutt, a misdemeanor in Alameda County.

"It's a smear tactic," yelled Rob Siegel, the man still being sought by police. "Sure it was my mustard, but that doesn't prove a thing. Besides, they have to prove with

Continued Page 4

Television Highlights

This week, you can expect to find some of the best programs right on your own TV set at home. Following are some of the highlights:

Monday: **(4) 6:30 I LOVE LUCY** Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R) **(7) 8:30 WILD KINGDOM** Marlon sits in a studio safe and sound, while Jim risks his life for some unimportant animal.

Tuesday: **(2) 7:30 LAWRENCE WELK IN BULGARIA** The famed band leader takes you through 60 minutes of musical merriment, all the time wondering why he is in Bulgaria. **(5) 9:30 BRUCE LEE IN REVENGE OF THE MEATBALL** Epic hero Bruce Lee punches his way through pasta, and rescues a pizza from 600 Neopolitan Ninjas.

Wednesday: **(11) 6:30 I Love Lucy** Lucy and Ethel hatch a plot to get Lucy into Ricky's show at the club. (R) **(4) 8:30 Gilligan's Island** Gilligan and the Skipper finally wise up and figure out that Ginger and Mary Anne must be getting awfully lonely right about now, and go for (Continued Page 4)

Weather

Local weather: Look for clouds throughout the morning, burning off near midday. Temperatures should soar to the mid 200's by late afternoon with heavy electrical activity and thunderstorms appearing around, oh, say

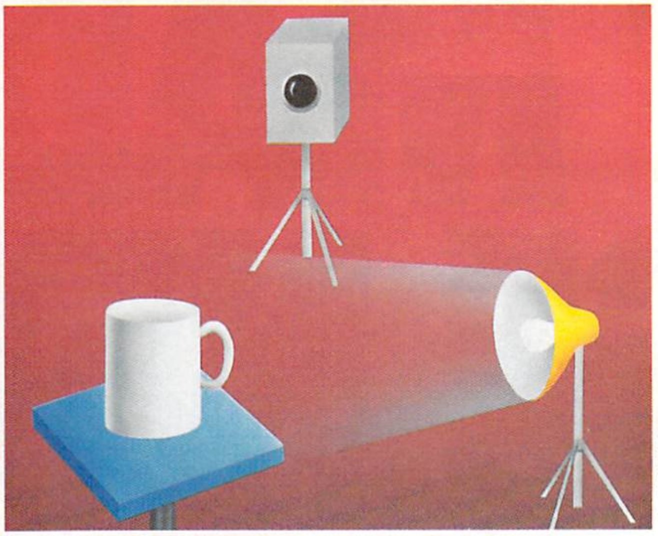
Continued Page 2

Text can be printed in every font available through GEOS. These documents were printed on an Apple Laser Writer

by John Iovine

Interfacing Commodore's User Port, Part 6

Building a Digital Camera, Part 2



Welcome to part two of the digital camera series. Sorry about missing that month in between, but I'm sure you will find that my time has been well spent. In this article we will construct the camera and program it for the low-resolution screen. I have included a number of options into the program such as gray scaling, coloration and on-the-fly timing changes.

Low Resolution Screen

The low resolution screen we will use this month is 40 pixels by 2 (16) pixels. The reason I gave the row quantity as 2(16) is that the program divides each text screen byte into two vertically stacked pixels. This makes our overall vertical resolution 32. Therefore our effective resolution is 40 X 32, which equals 1,280 pixels per screen.

In part three, I plan to jump into the bit map high-resolution screen with a 128 X 64 pixel screen. You may be thinking to yourself "Fine, but why are we bothering with the low-resolution in the first place?" The reason is that experiments in edge detection, character and pattern recognition, and neural networks will be much easier to accomplish with the low-resolution (1,280 pixel) screen.

It should be obvious that manipulating 1,280 pixels (or 640 bytes) of information is much easier and quicker than 8192 bits of information on the high-res screen. Additionally on the low-res text screen, addresses proceed in an orderly fashion. Starting at address 1024 in the upper left hand corner through address 2023 (bottom right). This order makes programming sub-scanning programs for edge detection, pattern recognition and neural networks that much easier.

Did you notice that the entire low-res screen is composed of only 1000 bytes, yet we are reading 1,280 pixels. The 1,280 pixels is our effective resolution, remember we are splitting our text bytes into two pixels. This means that we are using just 40 X 16 bytes of screen memory.

Extended Field of View

The photosensitive area of our chip is rather tiny, and with the low-resolution screen we are compounding the problem by using only 1/6 (40 X 32) of the pixels available to us in either one of the 128 X 64 pixel banks. This could make our processing difficult if we had to fit an entire image onto that tiny section of the matrix. To alleviate the problem somewhat, I decided to extend the field of view (FOV) of the camera. I accomplished this by accessing every other pixel, horizontally and vertically on the camera chip. So although our resolution is still 40 X 32 pixels on the screen, we are reading the image off the chip as if it were 80 X 64 pixels. The skipped pixels make the edges of the object a little choppy, but as you can see from the photos it's not too bad. I also centered the FOV on the matrix rather than leaving it to either side. This makes aiming the camera easier.

Black and White Camera

The black and white camera (B/W) operates at three to four frames a second. This is substantially faster than the gray scale camera and affords a real-time image.

Besides being an excellent camera in itself, it is also useful for aiming and adjusting the camera before going into the gray scale mode. In fact I advise you not to enter the gray scale camera any other way, especially when you are still a beginner. Because of the additional time the gray camera requires, images will smear across the screen if the camera is moved during image processing. This can make aiming the camera somewhat frustrating. Therefore it behooves you to have the camera at least partially aimed and adjusted beforehand. As you gain experience using the camera, you may find that pre-adjusting it in the B/W mode is no longer necessary before entering the G/S mode.

As stated, the program splits each text byte into two pixels — let's take a closer look at this and see how it operates. To divide each text byte I implemented four programmed characters. One white, one black, one top white bottom black and one top black bottom white. Depending on the scan number and feedback from the camera, the computer will choose the appropriate byte and store/display it on the screen.

Gray Scale

The gray scale camera gives us four shades of gray with one background color. How the camera interprets the binary information from the camera chip for the gray scale is based on individual timing cycles of each gray scale scan. To achieve four gray scales we are using four separate scans, each with its own timing cycle.

If you remember, in part one we stated that after a memory cell was charged to +5 volts, light falling on the cell would increase the rate of discharge in proportion to intensity and duration.

If the light intensity is such that a cell is discharged below the binary "1" threshold, lets say in the first scan/cycle, that memory cell (pixel) is read as a binary "0" and displayed as a white pixel on our monitor. Further let's say that another memory cell lying next to it (second pixel) discharged just above the threshold. Remember from part one during any read or write to a cell all memory cells lying in the row are refreshed, so at the same time our computer is reading the information, all the memory cells that did not fall below the binary "1" threshold are re-

freshed at +5 volts. So the computer reads that second pixel as a binary "1," displays a black pixel and continues.

What this boils down to is that the timing cycles are not additive. On our second scan we can't add a little time to the first scan and expect to read anything new. Our second scan must start from scratch (as far as timing is concerned) and last longer than the preceding one. To continue let's say the computer is now running the second scan and has waited 50 percent longer than the first scan, now that second pixel (memory cell) has fallen below the binary "1" threshold, the computer reads that memory cell as a binary "0" and displays it as a light gray pixel. This procedure is followed for all shades of gray. After the four shades of gray have been scanned, the program resets and starts over.

One point I would like to mention on the display procedure is that once a pixel has changed, subsequent scans will not alter the pixel any further, until reset. This must be included in the program or the screen would constantly go black. The computer would read all previously changed pixels and currently changed pixels as the same and would therefore display all of them at current gray level.

I hope I didn't bore you with the above dissertation on timing, but this information is critical when you begin adjusting the timing on the gray scale camera. I've provided on-the-fly timing changes as well as a menu option on the main program. At the time I was writing the program I was undecided whether I should allow the user to adjust and control the timing of the scans. I could have taken the easy way out by plugging in what I thought was a general default value. But I realized that all lighting conditions couldn't be met with one timing. Since flexibility breeds innovation and experimentation and inflexibility obsolescence, I opted to have the timing user adjustable.

256 Shades of Gray

Although we are using only four shades of gray in our program, you should be aware that it is possible to generate 256 shades of gray. Before I describe the procedure to do this, let's first examine our four gray scale generation. We are using the extended background mode as described in the *Programmer's Reference Guide*. Each gray scale scan is associated with one of the background color registers. This is how we also provide coloration, but we will come back to this later. In the default mode, we begin scanning with white, then light gray, medium gray, and dark gray all with a black background.

To generate a 256 gray scale you must employ a technique known as dot dithering. How dot dithering works is similar to the procedure we use to split our text byte into two vertical pixels. They both employ programmable characters. The computer generates each character on an 8 X 8 matrix. That equals 64 dots per character. Which dots are turned on or off generate the character pattern displayed. By turning off the standard character generator and programming our own characters we can generate 64 shades of gray. We do this by progressively turning on the dots one at a time for each character. Starting with one dot turned on in the center and progressively adding dots for each new character until we end up with all the dots turned on for character #64. (If this section on programmable characters is confusing, see *Programmer's Reference Guide*.)

To continue to our 256 shades we employ the extended background mode with our 64 dot dithered programmed characters. Now we have four backgrounds: white, light gray, medium gray and dark gray. Four backgrounds with 64 dot dithered gray scales for each background comes to 4 X 64, or 256 gray scales.

Although it is possible to do this it would increase the processing time tremendously. A more realistic attempt would be a 16 or 32 gray scale.

Coloration

Coloration is simple once we have the gray scale into place. A color is assigned to each extended background register instead of the default gray scale. This option is provided in the main program. By choosing that option on the menu, each color you enter in the sub menu for a particular scan will be displayed. It is interesting to note that the coloration can be implemented with the fast scan black and white camera. The first and last colors picked in the coloration menu will be displayed with the black and white camera.

This is the kind of technology used by astronomers and movie producers. If you have ever seen an astronomical photograph that had colors assigned to each B/W density, for improved image resolution, this is how they accomplished it. The photograph runs through an image enhancer that assigns a color to each density. The machines sensitivity is much greater than the human eye in determining B/W density. Similar techniques are used in coloration of old black and white movies.

The CCD technology used in video cameras, eye in the sky satellites, text readers, image enhancers and a host of other applications are very closely related to what we are doing and what we are doing with it.

Timing

Timing changes can be implemented on-the-fly during camera operation, or from the main program. The > key will increase timing, the < key will decrease the timing. The timing is changed by one millisecond for each screen scan that the key is held. If you are operating in the gray camera mode, each one of the timing cycles will be affected.

There is a kink in the on-the-fly timing changes you should be aware of. If you decrease the timing beyond 0 milliseconds, the timing will roll over to 255 milliseconds. This will show itself as a tremendous increase in scan time. On the other hand, if you increase the timing past 255 you will roll over to 0. At any time, if you should get stuck or lost in the timing, I advise pressing the "R" key which will return you to the main menu. There you can check, adjust or correct the timing by choosing the timing option for the camera you're currently operating. The menu option has the added advantage of reading the current scan times, that enables you to see where you are before modifying.

Since the program uses every microsecond available for processing, the keyboard is only checked once per screen scan. So you will have to hold down the key until the computer sees it, this may take one or two screen scans. In the fast scan B/W mode the menu will appear almost instantaneously. Alas, in the gray camera a couple of screen scans take longer.

Construction

As I promised in part one, our camera uses no additional circuitry aside from our computer. The most critical aspect of constructing the camera is the lens. The lens must be at the proper distance to be focused on the matrix of the digital camera chip. If you use the same components I have, then all the measurements have been taken care of. In the future if you would like to use a better or different lens or case, you will have to redesign the camera a little to place the lens at the proper focal length.

Lenses

The lens we are using for the camera is a surplus lens available from Edmund Scientific Co. (See parts list). I chose this surplus lens because it is very inexpensive for the quality. It is much easier to mount than a standard lens, since as you can see from the picture, it has its own housing, which means we don't have to build one. We can easily mount this lens on our camera housing with little or no hassle. The lens has an adjustable iris, (f-stop) that controls the light entering the camera, a valuable aid for various lighting conditions. This feature itself is worth the cost of the lens. It expands the operational latitude of the camera.

Begin construction by drilling the holes in the case for the lens and switch. The lens hole (approx. 5/8" diam.) is centered on the face of the case (See photo). Try for the best fit possible. With a good close fit you can actually screw the lens on instead of gluing it on with epoxy. Do not install the lens at this time, just drill all the holes. If you plan to add a small tripod as I have, drill an additional hole in the bottom of the case.

We are using two PC boards with this project, one that comes with the case, and an additional PC board that facilitates soldering and wiring the IC socket. Later these two PC boards will be mounted together.

Using ribbon cable begin soldering the card connector to the IC socket. Make sure the IC socket is centered on PC board #276-159 (See photo and schematic). Then solder the wires from the IC socket to the joystick plug RS# 276-1538. Solder in the capacitors to the IC socket. Note that both ground wires from the power supply and the user port must be connected to the chip for operation.

Now begin construction of the power supply (See photo and diagram). Use a small piece of perforated board to mount the four resistors, then make all the connections to the mounted resistors. Try to construct the power supply as you see it in the photo or as close to the photo as possible. Since it will be installed in the camera housing permanently, neatness counts, especially when you're installing in a small space.

The power supply is bi-polar, meaning it supplies both positive voltage and negative voltages to the camera chip. Notice the switch we use to turn the power on and off is a double pole. Do not substitute this type of switch, since both grounds for each battery must be turned on and off for proper operation. If you try to use a single pole switch and disconnect the main ground, electricity will still flow through the circuit, killing the battery and possibly destroying the camera chip.

You can check switch operation and the power supply with an inexpensive VOM from Radio Shack, $7.95, catalog #28-4012. If you have been following this series and building the projects, it's time you get one if you haven't already.

When you wire the power supply to the IC socket use a minimum of six inches of wire. This will make changing the batteries easier when they wear out.

Pre-Assemble Test

When you have gotten this far you're ready to check out the camera. Do this before installation, in case you need to correct any wiring error. Get the second IC socket that came in the package and install the camera chip onto it. That's correct, we are using both IC sockets, this brings the camera chip to the correct height in the final assembly. Insert the joystick socket into joystick port #2. Insert the card connector into user port, turn on computer. Load main program, from the main menu load B/W camera. When you are returned to the main menu, run the camera. At this point the camera screen should appear on the main screen. Turn on the power to the camera. Depending upon the

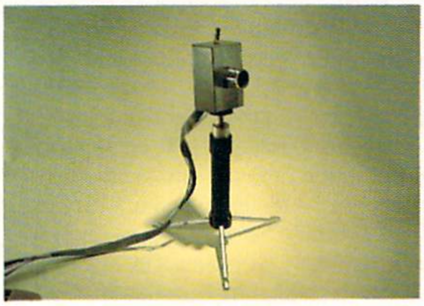


Photo 1. The finished camera with lens and tripod.

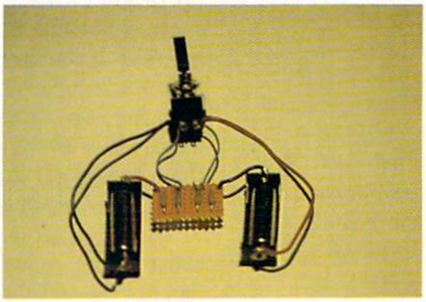


Photo 2. Power supply completed with batteries.

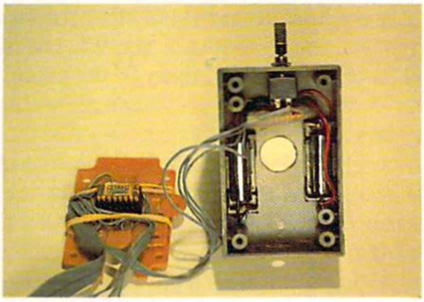


Photo 3. Power supply installed and wired to camera chip board.

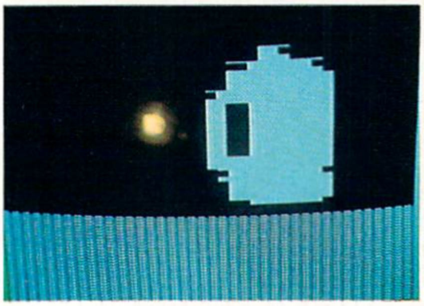


Photo 4. Black and White cup.

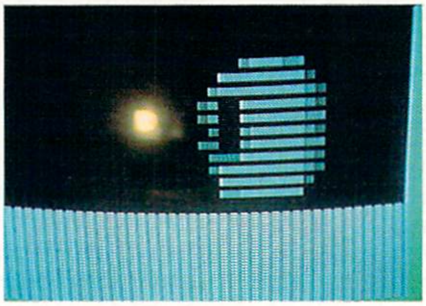


Photo 5. Gray scale cup.

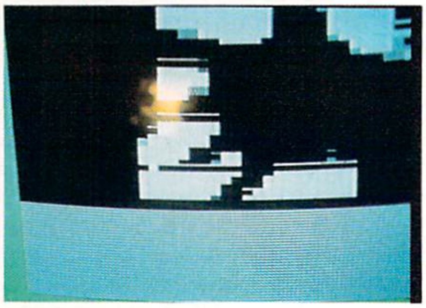


Photo 6. Hand in front of white screen.

Continued on pg. 60

Attention

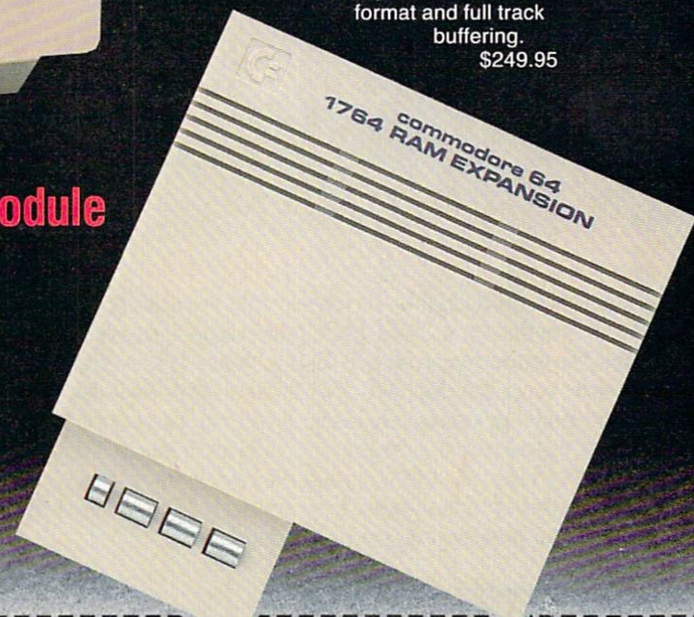
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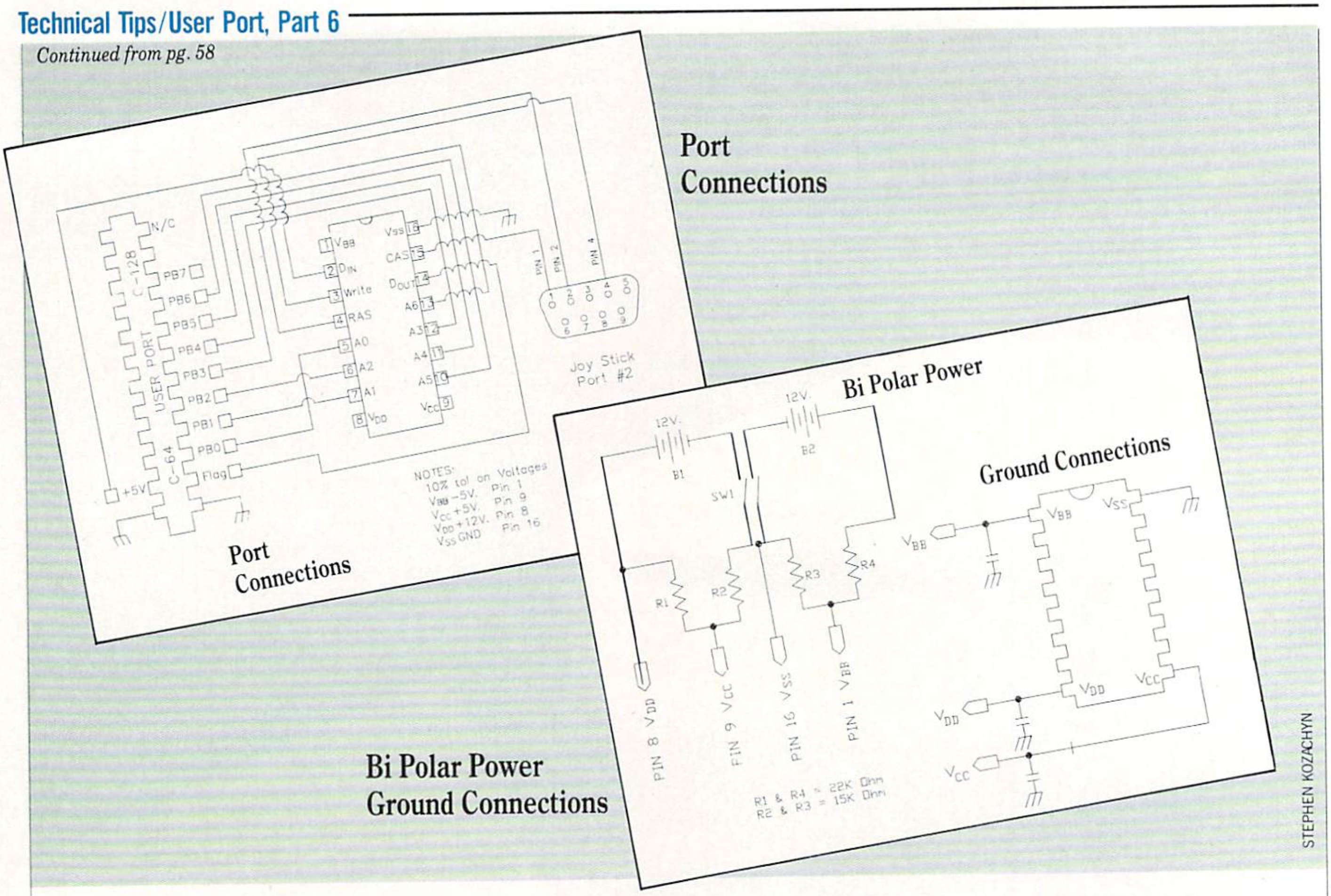
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Continued from pg. 58



STEPHEN KOZACHYN

amount of light available the screen could be either black, white or some combination. If it's black, make some light available to chip—the entire screen should then go white. If it's white to begin with, cover the chip with your hand to block the light — the screen should go completely black. If the chip passes this test, you can congratulate yourself, you're almost finished. If it didn't, turn everything off, start checking the power supply wires. Check batteries to make sure they are fresh. Finally, check the wiring from the user and joystick ports to the IC.

Final Assembly

We start with installing the power supply. Wrap some scotch tape around the perforated board holding the resistors to prevent accidentally shorting anything out. Glue or epoxy the battery holders on both sides of the lens hole, (See photo) install switch in the top hole with the perforated board underneath it. Take your time with the installation. You only have to do this once so don't force any components in. You have ample space.

Now get the PC board that came with the housing, cut a channel in one end of it for the wires to pass through. Place the IC wired PC board on top of this board and center it, making sure that you don't install the IC wired PC on the copper clad side of the second PC board. This could short out the unit. With the one board centered on the other glue or epoxy them together. You will notice on my prototype I used two rubber bands to secure the boards together, you can do this also if you wish.

Now mount the entire board assembly into the housing using the two screws that came with the housing for the board. Finally, mount the lens, if you succeeded in making a good fit you can screw it in, if not, glue or epoxy.

Lighting

When you start using the camera, start with simple lighting conditions and objects. In other words, start in a dimly lit room with a light on a simple white object such as the cup I have used for illustration. If you arbitrarily start aiming the camera everywhere, you won't be able to see the forest for the trees. You need to gain some experience adjusting the timing and f-stops of the camera. I detailed the light conditions for the cup, use that for a starting point.

Program Operation

Type in the respective programs for your computer. Take care in saving the programs under the proper names. This is essential for the main program to load the camera programs into memory and return.

After you have typed and saved the programs, load and run the main program. At the menu prompt choose item 2: "load the B/W camera." The computer will then load the B/W program and return to the main program. Then start the camera—item 7. In the beginning I advise you to use a simple subject to get acquainted with the digital camera. As a prop use a white cup as illustrated. Copy the lighting arrangement in the diagram. With this set up you can vary the f-stop on the lens and/or the timing cycle of the program. Notice the effects each one has on the image. You should see that the f-stop has more impact and should be used to adjust the camera to the basic lighting conditions. The timing can then be used for fine adjustments. After you're satisfied with the B/W camera picture, return to the main menu by pressing the "R" key. Once there, load the gray scale camera item 3, then start it running. Return to the main menu

by pressing "R" again. Now this will take longer to happen, as I stated before, the keyboard is only checked once per screen scan. Once you're back at the main menu choose the gray timing option 5. Change the timing to 50, 60 and 70. The program automatically returns to the main menu. Restart the camera. Notice the changes the timing has on the digital camera picture. Return to the main menu again and choose the coloration option 6. The sub-menu lists all color codes as you are prompted for the coloration of each scan. Choose whatever colors you like, the program will return automatically after all your choices are entered. Restart the camera, if you find you don't like the colors or wish to change them simply return to the main menu as before and change them.

Conclusion

Many projects say "you will enjoy this for years to come" or "cutting or leading edge of technology." I'm saying that this is a tool. With it you can explore leading edge topics like neural networks, character and pattern recognition. But it is still only a tool. It is up to you to use it. I left an open vector line in 1000 for sub-programs that you may want to add for pattern recognition and so forth. Slight modifications in the program will cause the image to stay the same when you return to BASIC from the camera, but that isn't necessary for recognition or networks, that would be esthetically pleasing to the user. If you are interested in programming articles for this camera involving pattern recognition or neural networks let us know.

We have just scratched the surface. In part three we will jump to the bit map screen, where we can better the resolution by 6X. You may be relieved that this will just involve programming.

Due to space limitations, only the 64 listings are presented this month. Next month we will run the 128 versions.

Parts List

Item	Qty	Part Number	Price
		Radio Shack	
Case	1	# 270-283	$3.69
Battery holders	2	RS# 270-405	.49
Switch DPDT	1	RS# 275-663	2.49
Circuit Board	1	RS# 276-159	1.49
			pkg/2
IC Sockets	1	RS# 276-1998	.89
			pkg/2
12 volt battery	2	RS# 23-144	.89
Ribbon Cable	1	RS# 278-772	3.59
Joystick connector	1	RS# 276-1538	2.49
.1 uf Disc cap.	3	RS# 272-135	.59
			pkg/2
22K ohm Resistors	2	RS# 271-1339	.39
			pkg/5
15K ohm Resistors	2	RS# 271-1337	.39
			pkg/5
IM-16 D-Cam Images Co. P.O. Box 313 Jamaica, NY 11418	1	IM-16	32.00
Lens Edmund Scientific 101 E. Gloucester Pike Barrington, NJ 08007	1	E41,146	11.50
Card connector Digi-Key	1		

Continued on pg. 106

by Shay Addams

Quest for Sequels

News and opinion from a leading explorer of those fantasy realms called adventure games.

Just as television has its summer reruns, adventure gaming has its summer sequels. I returned from an all-too-brief vacation to find three of them lurking in the shadows of my monitor: *Eternal Dagger* (sequel to *Wizard's Crown*), *Alternate Reality, the Dungeon* (sequel to *Alternate Reality, the City*) and *Roadwar Europa* (sequel to *Roadwar 2000*). Judged solely as a sequel, *Dungeon* is the most impressive accomplishment.

One reason is that the original game lacked certain things — a goal, for example, and magic spells — that most adventurers expect in such a scenario. *City* offered many opportunities for mapping and developing a character through combat, but the program's sole purpose was to enable you to build up a character strong enough to survive future installments in the series. (*Alternate Reality* is planned as a seven-part series in which each area, contained on a separate disk, can be entered from one or more of the others.) This seemed like a waste of time to me and still does, especially since it took them over a year to come up with a program in which *City* characters could finally be used.

That program is *Dungeon*, set in a four-level maze beneath the City of Xebec's Demise, where you were originally dumped after being kidnapped by aliens and left on this planet. Your long-range goal in the series is to escape, which can't be accomplished in this game, whose goal is simply to escape the Dungeon.

Dungeon's strongest new feature is its introduction of Guilds. There are six Guilds, such as the Wizards of Law and the Guild of Chaos, and your good/evil alignment is determined by your choice. In addition to typical attributes such as strength, the program keeps track of your actions and how they relate to your alignment. A Wizard of Law, for example, who kills a member of a good Guild can be reprimanded or even ejected from this Guild.

Guild membership also entitles you to a locker where you can store weapons and loot, a Guild ring that empowers you with spell-casting ability, and a chance to learn and practice magic spells — none of which were possible in the original *Alternate Reality*. (Yes, I found it hard to believe someone had done a fantasy role-playing game without magic spells, too.) Combat hasn't changed much, for you still carry primary and secondary weapons that may be switched during combat, but the inclusion of spellcasting makes a dramatic difference during encounters.



SUSAN LIPPMAN

Sequels have always been a mixed blessing.

The maze is a 64 X 64 grid, and with four levels that amounts to more than 16,000 locations. Mapping, however, is easier than in *City*. Although you still advance only a few inches with each move, not a complete map square, wooden beams in the walls clearly mark each square. You can also obtain a compass that proves handy, and the location spell will reveal your precise location according to its north and east coordinates.

Music and song accentuate many encounters and discoveries. Enter a Guild, and the lyrics of a song appear in big letters while a tune plays. One by one, each word is highlighted in time with the music, and this variation on the "follow the bouncing ball" routine adds atmosphere and occasionally drops a few clues. You get a first-person view of your location and any monsters. Graphically the game looks better than *City*, even tossing in a bit of spot animation here and there, though it still can't compare with the lush illustrations of *Bard's Tale*.

It is possible to create a fresh character for *Dungeon*. It is also possible to swim the English Channel, but most people find it easier to take the ferry. So unless you're looking for a hard time in the early phase of the game, import a character from *City*. Unless you've got a strong character ready to go, consider this an advanced-level game. Even with such an asset the game is still tough and should give any dungeon-delver a good run for his money.

Shut That Window!

Built around the interface and combat routines seen in *Wizard's Crown*, *Eternal Dagger* makes you responsible for the lives of up to eight characters as they attempt to defeat the hordes of monsters invading the Middle World and seal the Demon Portal through which they entered. (To do so they'll need the magical weapon for which the game is named.) No revolutionary features are introduced in *Dagger*, but the animated combat is more detailed and faster, and other routines function more smoothly. Your party now moves as a unit while in a dungeon, so you don't have to use the "follow" command that often led to characters getting stuck in corners, and some of the rarely-used combat commands were eliminated. Outdoor scenes are better illustrated, and the program's overall feel is more polished and enjoyable than *Wizard's Crown*'s. The magic system is unchanged, offering 20 spells, but this intermediate-level challenge is really designed for the "long swords and chain mail" crowd anyway.

There aren't as many puzzles as in *Crown*, for this is an even more combat-oriented scenario. In battle, you can choose a quick or tactical fight. The latter allows you to pick one of 22 combat commands — use magic, aimed attack, and so on — for each of your warriors and wizards via one-keystroke commands. My first battle occurred moments after I hit the aerial-view countryside, and it took me over 30 minutes to wipe out two dozen zombies and ghouls. The quick combat option saves time, but prevents you from using certain items and spells. So unless you truly enjoy wargaming as much as you do adventuring, *Eternal Dagger* will seem more like "eternal combat" to you. Still, someone who completed *Dagger* recently says the monsters are easier to beat than in *Crown*, which he gave up on in disgust halfway through.

On the Roadwar Again

When the going gets tough, the tough get going — and if you've already wiped

Continued on pg. 111

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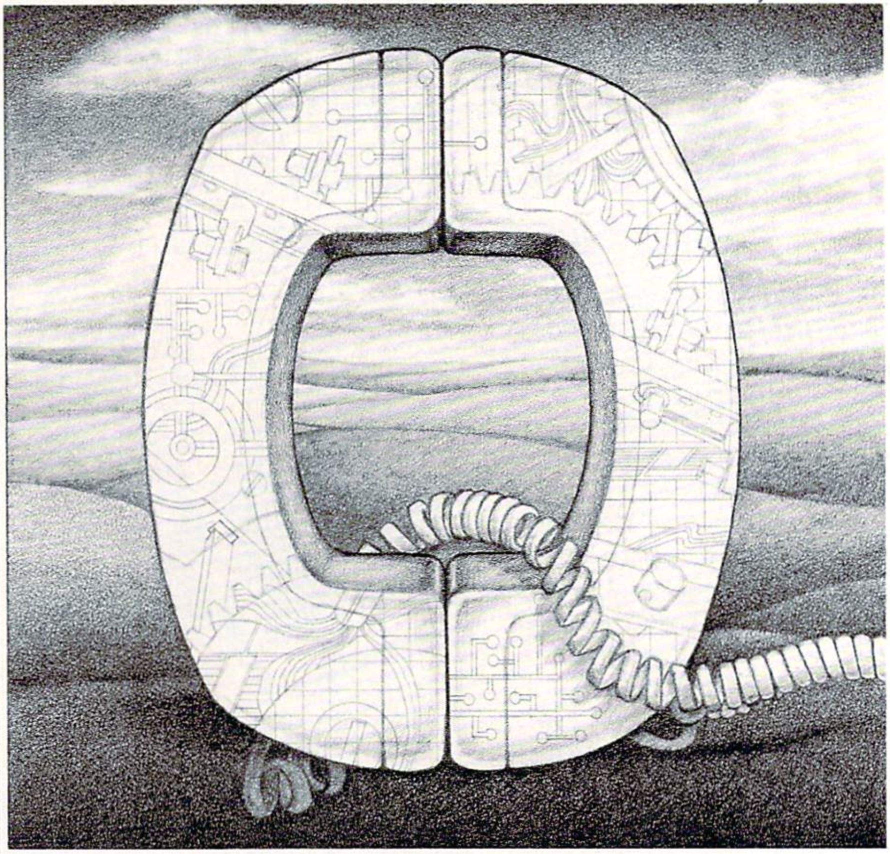


Only Amiga Makes It Possible.

by Robert W. Baker

Inside Q-Link

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.



MIA BOSNA

Back in the fall, I sat in on an on-line meeting with a number of the sysops who manage the Commodore Community. During the meeting I asked for ideas or hints that might help Q-Link users. Here's a collection of some of the ideas that we hope you'll find useful. With a little luck we'll have more for future issues.

First of all, one issue that seems to constantly come up is the use of on-line messages. Many users think that if someone is on-line, they can answer an on-line message right away. However, that's not always the case! If someone is uploading or downloading files, entering a message in the message boards, participating in an auditorium event or group meeting, it just might not be convenient or even possible to answer an on-line message.

It's always advisable to use an E-Mail message first to contact someone and then use on-line messages once you know the individual is ready to talk. Once you establish contact, it might even be better to meet in a People Connection room or one of the various meeting or conference rooms. This can provide much quicker interaction than on-line messages when needed, or if you're going to be talking for awhile.

Most heavy users of the system, like sysops and myself, try to clear out any current E-Mail messages when they first log onto the system. Then, any new messages that appear while online can easily be noticed and handled when there is a break in the action. Besides, answering older messages first gives the sender a chance to catch you online with another comment if they need you.

Before sending a message to one of the sysops, consider whether your message might be more appropriate for one of the message boards. The sysops occasionally get a number of messages or questions on the same subject. If you post the question on a message board, the Sysop can answer it once and the information will be available for a number of people. It also gives other users a chance to add additional information.

If the answer to one of your questions is long winded, or a sysop is getting a number of questions on the same subject, the sysop might post your question and the response on a message board himself. That way the information is readily available to everyone, and anyone who asked questions on that topic can be sent short messages indicating where the information is available. This can save a sysop a considerable amount of time!

By the way, if you're trying to contact the sysops, keep in mind that the Byte Bar in the Commodore Community is staffed nightly by various sysops from that area. You might be able to catch the person you want there, and talk directly. Plus, there may be other users or Commodore Gurus there that could help with a problem as well.

On the other hand, use of the message boards gives you access to a wide variety of users with almost limitless knowledge on all sorts of subjects. In many instances, your exact situation may have already been encountered by someone else online who can quickly provide a useful comment or the solution to your problem. Many people overlook the value of this added support.

As a general rule, try to pick the most appropriate place for your message before you post it. Keep in mind that there are special message boards in the classified section of The Mall if you want to buy, sell or trade something. Such messages should not be placed in the other message boards on the system. Also, posting duplicate messages in different message boards only wastes system resources.

When scanning the message boards in the Commodore Community, be sure to check the "What's New" and library areas for information on the latest happenings, detailed product reviews or more information on various topics. Many people don't realize the large number of informational text files within the libraries besides program files. After downloading a text file, all you need is the Sprint or similar sequential file reader/printer utility to view the information.

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Continued on pg. 117

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Ned Lerner and Chuck Yeager:

Taking Computer Flight to New Heights

by John Jermaine

On October 14, 1947, an unknown Air Force captain named Charles E. Yeager made aviation history. Piloting the experimental Bell X-1 rocket plane, he became the first person in the world to fly faster than the speed of sound. Forty years later, retired Brigadier General Yeager is still in the public eye. The story of his history-making flight was told in the recent movie *The Right Stuff*. General Yeager's book (aptly titled *Yeager*) remained on the best-seller list for months, and the General himself can now be seen in a series of television commercials. In private life, the master pilot still finds time to fly a number of different aircraft (both civilian and military). Even today, he occasionally breaks certain aviation performance records just for the fun of it. Yes, this is the Yeager we all know and admire, but most people know little about his latest project: *Chuck Yeager's Advanced Flight Trainer* (*AFT*). This article examines the development of that program and concludes with a few words from General Yeager himself. To get things rolling, I spoke with Ned Lerner, the 28-year-old designer of the *AFT*.

Jermaine: What inspired you to write the *Advanced Flight Trainer*?

Lerner: During the summer of 1985, I was shopping around for an inspiration. I really wanted to dazzle the software buying community with a three-dimensional something or other. Simulations seemed to fit into that line of thinking, particularly flight simulations, because they tend to merge a knowledge of aerial mechanics and science with the thrill of flying. A second factor also came into play. One of my childhood fantasies was to manipulate the controls of an ultra-modern aircraft, high above the clouds. Even if I were a pilot in real life, I probably wouldn't be flying any of those airplanes, because most of them are used exclusively by the military. I could fulfill my dream, however, in a software sense by creating a realistic flight simulation, featuring all of the planes I wanted to fly.

Jermaine: Did you examine the other flight simulators? If so, what did you think of them?

Lerner: After studying the other flight-related software on the market, I arrived at two conclusions: (1) all of the programs were similar in content, and (2) they couldn't hold my attention for very long. In many respects, this material reminded me of the driver's education class I had tolerated as a teenager. The programs supplied fundamental flight instructions, defined a number of aviation terms, explained how to use the switches and gauges on your airplane correctly, etc. In short, you learned the accepted procedures for flying the aircraft safely and how to get from one point to another without becoming lost. Now don't get me wrong. Every pilot has to learn the basic skills of aviation, but no one said you had to stop the learning process at that point. I wanted the user to fly a number of different aircraft as fast as he possibly could. Once the novice pilot felt comfortable in the air, he could use simple visual instructions to perform a series of complicated aerobatic stunts. My final goal was to make each experience fun and entertaining, instead of resembling a textbook lesson.

Jermaine: How was the flight environment of the program developed?

Lerner: Flight simulations, in general, have traditionally been created by initially setting up an aerodynamic model. This model is a tiny defined universe where gravity, lift factors, thrust, drag, etc. exist, as they do in the real world. Once the model has been completed, the programmer begins gathering the flight characteristics of every plane in the program. The information he acquires, for each individual airplane, will eventually be stored as a separate data base within the model itself. We decided to follow this accepted procedure because no one came up with a better way of doing things. By the way, Gabe Hoffman developed the aerodynamic model for the project. He was the perfect man for the job because Gabe had been a captain in the Air Force and held a degree in aerodynamic engineering.

Jermaine: Tell me more about the problems you faced.

Lerner: Commercial flight simulators start out at about $50,000 and go up in price to the millions of dollars (NASA uses the most advanced machines). The top-of-the-line simulators have multi-megabytes of memory (1 megabyte = 1,000,000 bytes), with palettes containing over 65,000 colors. We, on the other hand, were dealing with microcomputers. Our machines had 64-256K of memory, and four to sixteen colors on their palettes. After experimenting for a while, I came up with an interesting set of graphics. These pictures could be easily adapted for use on both the IBM and 64 computers, while operating on both systems at approximately six frames per second.

Creating the correct feel and performance of each airplane in the program was another matter altogether. Constructing the data bases was one thing; getting them to operate correctly was another. It often became necessary to alter the facts a little to obtain the desired response from the computer. It's also interesting to note that flight simulator people and aircraft designers face many of the same problems in their work. The most difficult planes to generate on paper, or re-create in a software sense, are the ultra-modern high-performance machines. Naturally, our simulation of an SR-71 (nicknamed the "Blackbird") became a major source of headaches around here. It's the


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fastest aircraft on the planet, and we just couldn't make it fly like it should. In case you're interested, the SR-71 is a military reconnaissance jet. It was designed to replace the U-2 spy plane and has probably been flown by fewer than 100 people in real life.

Jermaine: Was it difficult getting Electronic Arts and General Yeager interested in the program?

Lerner: Electronic Arts was involved in the project almost from the very beginning. Looking back on things, it's funny to think that we were programming a flight simulator at a company located a short distance away from the runways of San Francisco airport.

By late summer of 1986, we had been working on the basic flying program for almost a year. It ran smoothly, looked sharp, and faithfully re-created the performance characteristics of several different airplanes. Even though the people who saw the program liked it, I secretly felt it lacked a certain quality I couldn't put my finger on. Several weeks later, Stewart Bonn (VP, Creativity Division) came up with a novel idea which eventually took care of that factor. He reasoned we should get a well-known pilot, like Chuck Yeager, to co-design the product. No one else was even considered for the job, because Yeager is a living legend in the field of aviation. He had flown practically every aircraft we could name, and his influence on the project would add a new dimension of realism and authenticity to our simulation of flight.

Each of these planes needs to be analyzed by a trained test pilot, so the user can literally assume the role of Chuck Yeager and learn what makes these planes tick.



There was only one flaw in this master plan: I didn't believe it was possible to get General Yeager interested in our work. Stewart had other thoughts on the matter and set things in motion to contact the famous aviator. Our people initially had to explain to him what Electronic Arts was. They also convinced him that the project wasn't a risky venture, and his input, as an experienced pilot, would make the program superior to other flight-related software on the market. General Yeager officially joined the team (on paper) in October of that same year.

Jermaine: Would you describe your earliest design session with General Yeager?

Lerner: Our first face-to-face meeting took place during March of 1987, in the office of the General's accountant. A party of five had driven up to Grass Valley, CA, in a pouring rain, to ask General Yeager to look things over and tell us what he thought of the program. As we were sitting there in the office, listening to the rain outside, Rich Hilleman, Associate Producer at EA was first to spot the Blazer entering the parking lot (license plate BELL X1). A few moments later, we heard the unmistakable West Virginia drawl outside the door, as pure and easy-going as the man on TV who sells spark plugs with a shotgun. For a brief second, I remembered the opening scene of *Patton* where George C. Scott steps forward, dressed to the teeth, in full military regalia. The door suddenly opened, and there he was: wearing cowboy boots, blue jeans, and a polo shirt under his racing-style jacket. General Yeager had a trim figure, and his face was tan, well weathered, as if he had spent a lot of time outdoors. The General stepped forward, shaking hands with the members of the group, but I sensed a certain degree of reservation in his actions.

To get past this awkward beginning, we loaded in the current version of *Advanced Flight Trainer*. I flew the simulator for a while, and offered to let General Yeager take over. "I never fooled with these things," he said. "That's because, you know, the damned things are so—" he searched for the word, "insignificant. The problem," he said, "is how mature do you want to make this dang thing?" Yeager leaned back in his chair and pointed at the P-51 Mustang on the monitor screen (it was the most modern plane featured in the program at that time). "You guys are stereotyped is your problem." he said, "These planes are okay, except people want something more modern like an F-14. If you want to really scorch something, hell, you can program the X-31 in there, the aerospace plane," he said with enthusiasm. "Now, see, you got some kid who can say, 'Man, this thing is smoking along at Mach 25.'"

The ice had finally been broken, and we all began contributing to the conversation. After discussing the subjects of liquid oxygen fuel and the current types of aircraft that are touching the edge of space, the day was practically over. In the meantime Glennis, the General's wife, had invited us back to their house. Now was the moment of truth. We had gone through the entire program and were waiting to hear what General Yeager thought of the project overall. "This thing's pretty dang realistic," he told us. "You've got a lot of goodies in there." Then a smile appeared on his face. "But in my opinion, it would be interesting to dogfight." (We are currently at work on the sequel: *Chuck Yeager's Air Combat Trainer.* Unfortunately, I can't tell you anything more about that project at this time.)

Jermaine: Had General Yeager worked with computers before this time?

Lerner: Yes and no. Computers exist in the control systems of all modern military aircraft, so I guess you could say he has quite a bit of computer experience. When General Yeager saw the IBM system for the first time, he said it reminded him of the cockpit of an F-20. On the other hand, the General doesn't own a home computer and really hadn't worked with one until the *AFT* project came along.

Jermaine: What was it like to work with the legendary Chuck Yeager?

Lerner: During our design sessions with the master pilot, some interesting situations occasionally arose. One day we were talking about the joystick and its relationship to the computer. Every time we mentioned the word "joystick," the General started laughing a little bit louder. Someone finally asked him why he was so amused, and Yeager said he hadn't heard that term since WWII. We had taken it for granted that pilots called the stick a "joystick," but recently I discovered most of them use the term "control stick."

A short time later we were designing the graphics of the objects on the ground. A member of the group asked General Yeager if he remembered seeing anything interesting as he flew over the Mohavi (during his early days as a test pilot). "We never had much time for scenery," he told the individual, "Besides, Edwards (Air Force Base) doesn't have much to look at."

After working closely with the man for a period of time, it soon became apparent why he's considered to be one of the top pilots in the world today. General Yeager seemed to anticipate everything we were planning to do and understood anything we explained to him the first time. It was also great to have someone around who could answer almost every question we had about a variety of different aircraft, while actively contributing fresh ideas to the group on a regular basis. I guess I was most impressed with General Yeager's positive attitude toward the project. He took things quite seriously, seeing the program as an authentic simulation of flight and not merely a game. He also permitted us to add the equivalent of military training to the scheme of things. It was a pleasure to work with a man of his caliber.

Jermaine: Can you tell me more about the *Advanced Flight Trainer*?

Lerner: Basically, the program consists of four parts: Flight Instruction, Test Flight, Formation Flying and Airplane Racing. If you're already a pilot, you probably won't learn very much from the Flight Instruction portion of the program. It's there to teach the average consumer the basic skills of aviation.

The Test Flight exercise gives you the perfect opportunity to test your new abilities. Of course, you have to take off and land the plane safely, but while you're in the air, the pilot is completely on his own. He can simply fly around, add a wind factor to the environment, test the performance of his craft, or try to steer it through one of the seven 3D obstacle courses. This segment of the *AFT* also features three experimental planes of our own design. Each was named after someone who worked on the project (mine was called the Lerner Aeronautics XNL-16 Instigator). We had a lot of fun designing these unusual aircraft, but they

Continued on pg. 110

And now a few words from General Yeager

Jermaine: Would you give me some background information about yourself, General Yeager?

General Yeager: I'm 65 years old and happily married with four children (two boys and two girls) and 12 grandkids. And yeah, I have a lot of hobbies. I repair my own cars, do some woodworking around the house, sneak off to do a lot of fishing, and still find time to fly on a regular basis.

Jermaine: How often do you fly, and what types of aircraft do you use?

General Yeager: Oh, year in and year out I probably average ten or 15 hours a month. Just to give you a feel, this year I've flown F-4's F-15's, F-16's, F-18's, two different types of Harrier jets (AV-8A and AV-8B), and a lot of light stuff.

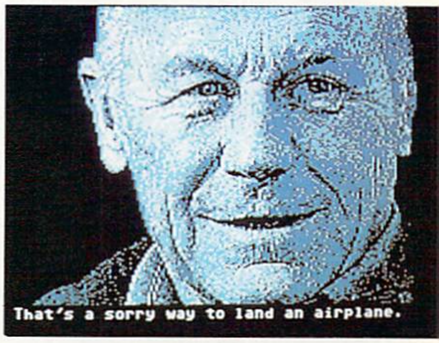
Jermaine: If home computers and the *Advanced Flight Trainer* had been around when you were growing up, do you think they would have altered the direction of your life?

General Yeager: Probably not, John, because I grew up in a world where mechanical devices were state-of-the-art. Electronics, as we know it today, wasn't even on the drawing boards during the years leading up to World War II. Most of the kids I knew back then had pinball machines, if you remember those crude things. We also played a lot of Ping Pong and had other activities which helped us to develop good coordination. I spent most of my time as a young man studying internal combustion theory and the mechanical marvels of the age. As I became older, that knowledge kept me busy while other people were looking for work. Getting back to your question, I don't think computers would have helped me very much because I was mechanically inclined.

Jermaine: Is it true that you became an "Ace" pilot during a single day of World War II? Was that an unusual feat during those days?

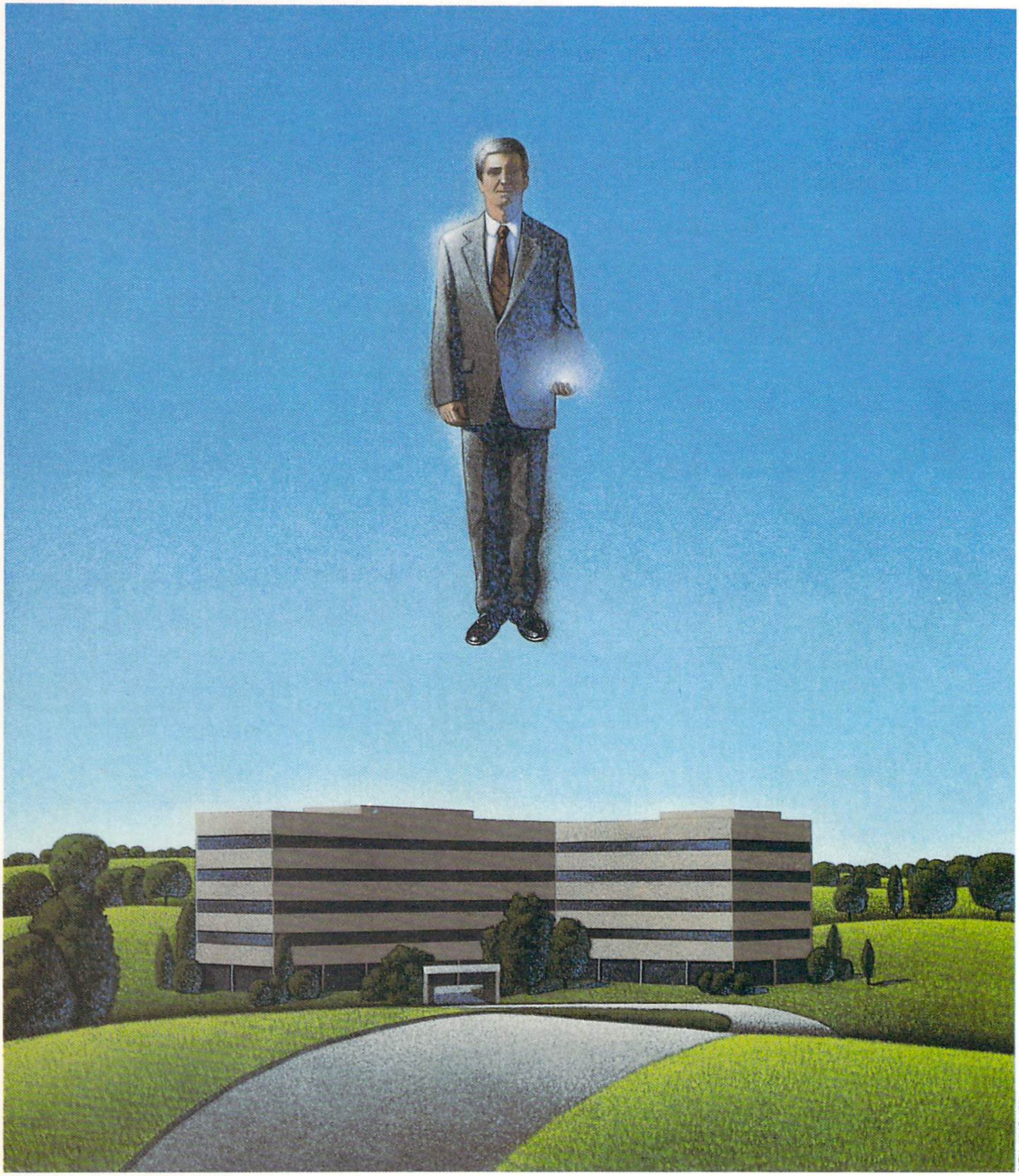
General Yeager: In order to become an ace, you had to destroy five enemy planes in air combat. Few people achieved this status during a single mission because: (1) You normally didn't run into very many German aircraft at one time, and (2) most pilots couldn't survive a dogfight long enough to do the job. On the day I became an ace, I was lucky enough to be leading my squadron. That allowed me to spray my fire at the enemy craft as soon as they were within range. The rest is history. For the record, I have accumulated a little better than 14,000 hours of total flying time (in the military), with about 13,000 of them taking place in fighters.

Continued on pg. 110



"Yes, the Bell X-1 has its own set of peculiarities, and you will experi ence them first-hand in the *Advanced Flight Trainer*."

Adventures at


NEIL HUGHES

Infocom

by Russ Ceccola

At the basis of Infocom's success in the software industry is a collection of hard-working people dedicated to making Infocom games as great as they can be, while maintaining a sense of humor and thoroughly enjoying their jobs. I visited Infocom recently to interview and learn about the people and company responsible for the classic Zork games and many, many others.

Airport Entrance
You are standing in the entrance of Boston International Airport. An exit leads west and a ramp goes up from here. There is a dollar bill here.
>TAKE DOLLAR BILL
As you bend over to pick up the dollar bill, a little boy runs over to you, leading his mother by the hand. The boy is crying. He says that you took his dollar and, after the mother slaps you for being cruel to children or some such nonsense, the duo walk away. You are left embarrassed and confused.
>GO WEST
Outside Airport
You have wandered onto the sidewalk outside of Boston International Airport. A cab pulls up in front of you and the driver looks impatiently at you. There is a small white stone here.
>TAKE STONE
Taken.
>GET IN CAB
As soon as you step into the cab, the driver floors the gas pedal and you find yourself smashed against the other door. The driver apologizes for the inconvenience and begins to ask you where you're going until he notes the look of mesmerized anticipation on your face and realizes that you must be headed to Infocom in Cambridge. "Happens to the best of them," the driver chuckles.
>EXAMINE STONE
The stone is a small white piece of smooth marble that feels unusually light.
>WAIT
The driver takes you to the front of the building at 125 Cambridge Park Drive and tells you that the fare for the ride is $16.90.
>INVENTORY
You are carrying: A wallet.
>EXAMINE WALLET
Inside the wallet, you find $25 and a movie stub. Upon seeing the movie stub, you remember that terribly boring and stupid summer movie about the return of a giant shark to claim revenge on a family.
>GIVE $20 TO DRIVER
The driver thanks you for your generosity and leaves you standing on the pavement in a cloud of dust as he speeds away.
Outside 125 Cambridge Park Drive
You are outside the building that houses, among other offices, the headquarters of Infocom, the destination of your visit to the Boston area. A door enters to the east. The stone is glowing with a dark blue light.

What you have just read is an example of interactive fiction, the trademark of Cambridge-based Infocom, describing fictitiously the jaunt I recently took from the airport to Infocom's offices.

For those of you who don't know what interactive fiction is all about, a definition is in order. Infocom interactive fiction games are entirely text games. There are no pictures, moving graphics or space invaders that pop up on your screen. Rather, the computer responds to your typed commands with prose descriptions of your surroundings, the consequences of your actions, what you see, hear and feel, what objects are within reach and which direction you can traverse.

In an interactive fiction game, you control a central character or, in some cases, more than one character, through your commands. You must assume the role of that character as if you were really in that universe-on-disk. Hence the name interactive fiction. You control the events in the story and time passes only in relation to the entering of commands. There is no set method to finish a story. For the most part, there are certain things you must do to finish, but the order in which you do them varies, depending on the game.

For example, in the above story, I didn't have to pick up the dollar or stone. Trying for the dollar was a nonsense action, as we found out afterwards. The stone, on the other hand, has some distinct purpose. In this case, it sensed closeness to Infocom's offices. Typical of Infocom games, you sometimes don't find out the purpose of an object until later in the game or by experimenting. Also, examining objects is very important. I wouldn't have known that I had any money unless I had examined my wallet or that the stone was different in that it was unusually light for its size.

The commands that you can use in an interactive fiction story are much more numerous than the two or three I used above. Aside from going in different directions and examining objects, you can do all sorts of other things, including attacking other characters, using objects and talking to characters. There are special commands that allow you to change your playing environment as well — like SCRIPT, which prints a transcript of your game session on your printer, if you have one. Also, some games have commands specifically made for them (the Enchanter games use CAST for casting spells). Commands use verb-object relationships to get things done. The structure is easy to learn and in no time you can be playing. Most games also give you some kind of rating or score and the goal of that game is to reach the maximum status or score.

"You are standing in an open field west of a white house, with a boarded front door." Sound familiar? This is the first line of what has since become a classic in the realm of adventure games and software, *Zork*. Four college students at M.I.T. designed the game after being totally enthralled with *Adventure*, created by Willie Crowther and Don Woods. The first "adventure game" ever, *Adventure* appeared on M.I.T.'s ARPAnet in the Laboratory for



Computer Science about a decade ago. These four men were Tim Anderson, Dave Lebling, Marc Blank and Bruce Daniels, the first three of whom went on to form Infocom, along with Chris Reeve, Joel Berez and Stu Galley in 1979.

Since then, business has gone up and down, but Infocom's staying power in the marketplace led to a $10 million gross last year. Infocom has sold over two million interactive fiction titles to date, one million of the *Zork* trilogy alone. Their place in the software industry is a direct result of the lengthy and exacting evolution of a game from conception to the software store's shelves.

The initial idea for a game starts with an imp. There is usually a meeting scheduled when an imp decides that he/she wants to start designing a new game. At

Infocom has sold over two million interactive fiction titles to date, one million of the *Zork* trilogy alone.

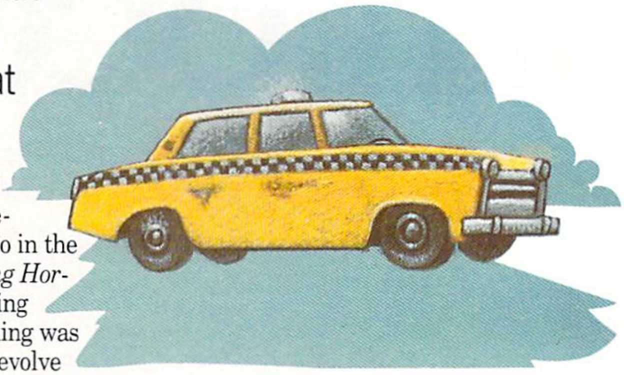
this meeting, the imp introduces all of the ideas that he/she has and they are voted upon and talked about. This gives the imp a good idea of which project to pursue.

An imp usually takes four to six months to design a game. In that period, many changes will be made in the direction the game takes. Each imp has a different approach to the physical design of the game. Dave Lebling starts by drawing the geography/locations and then populates them with the objects and characters in the game. Steve Meretzky writes down his ideas and develops the story line first. Only after these elements are worked out does he progress further. He then develops the puzzles and finally works on the geography of the game.

Designing interactive fiction is not as easy as just coding what must be done to finish the game. That's the first part. Then the imp must account for all other situations that can occur based on the many strange things that people try. There has to be a limit. For instance, an imp has to try to think of every possible thing that a person can try to do with an object to ensure that there are no fatal crashes. Sometimes, an imp decides that

Then the imp must account for all other situations that can occur based on the many strange things that people try.

he doesn't want people to try something and makes it impossible to do in the game. For example, in *The Lurking Horror,* on the roof of the Brown building there is a peach tree in a tub. Lebling was originally going to have a puzzle revolve around the tree and a single peach on its branches but instead covered the tree with slime so that it couldn't be climbed. His reasoning: "I wanted to keep people from climbing the peach tree—I didn't want to have to check all possibilities such as players jumping off the tree, cutting its branches, etc."



Trying to code all possibilities can be very tedious. To avoid burnout, the imps meet once a week to talk about puzzles and how other imps' programs are coming

Creative Services

The Creative Services department is responsible for putting together the packaging for all Infocom games. Consisting of Carl Genatossio (Creative Services Manager) Elizabeth Langosy (Staff Writer), Gayle Syska (Product Manager) and Angela Crews (Product Services Supervisor), Creative Services makes the game look and read as attractive as possible.

Early in the testing stages, Elizabeth, Angela and Carl play the game for about a week to get the feel of what's happening. They think about ideas for a few days and then meet with the game implementor to determine what should go into the game's packaging. After deciding what the package will look like and what enclosures will be used, the work is started. Carl contracts photographers and artists to work on the game's cover and inside art. Elizabeth writes the manuals and any other written material included with the game. Angela investigates appropriate gimmicks for the game and the production of these enclosures.

Angela Crews has had some interesting experiences in searching out Infocom's trademark enclosures. For *Leather Goddesses of Phobos,* which won an award for Best Software Packaging, she contacted many companies to assemble a large number of samples for the Scratch 'N Sniff™ card included in every package. Game designer Steve Meretzky followed people for days with these samples in hand urging them to guess what the smells were. Another conquest that Angela made was the plastic bug included with *The Lurking Horror.* Again she contacted numerous companies and had literally hundreds of bugs in the drawers of her desk. Eventually, after rejecting ones that grew in water and ones that were too expensive, the right one was picked.

A recent change made by Creative Services was the elimination of the gray pinstriped package that opened to reveal the story book for the game. Genatossio explains that the package was designed to be browseable in the stores, but that store owners demanded that they be shrinkwrapped to prevent dog-eared copies. "We had this browseable shrink-wrapped package that wasn't really browseable anymore," remarked Genatossio.

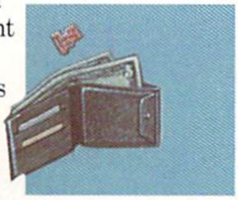
Langosy offers, "People found it awkward putting that box on their computer table to read the book, which was unremovable. The format forced us to have a booklet for each game, as well. Also, certain enclosures couldn't be used because they couldn't fit in the tray."

The packaging for *The Lurking Horror* and *Stationfall* introduced a new format for Infocom games. The two boxes look very exciting and all of the enclosures are removeable so that examination is easier.

Infocom has found that many people buy the games for the packaging. Also, the packaging includes items helpful in the game and, more recently, the enclosures have become an effective anti-piracy safeguard. The enclosures sometimes contain code numbers, and these items just can't be duplicated. At any rate, the packaging of Infocom games is one of the attractive features of the company's products, part of the reason the games jump right off the store shelves.

along. They exchange ideas and trade stories pertaining to game design and interactive fiction to get a fresh perspective on things and keep themselves abreast of the others' activities. Other times, these meetings are just fun, with no talk at all about designing tips. Rather these are an opportunity to let off steam that builds up after deciding how many times to allow a player to mess up in the game before getting killed. Lebling described Infocom's philosophy: "We try to make each game as complete and clean as possible. I'm sure we spend far more time in testing than any of our competitors. We work very hard to make things as rich as we can. We don't like nothing to happen in response to the player's command if we can help it. We'd rather have the game work so that if you try something reasonable, you'll get some kind of response for your actions."

The key word at Infocom is "we." It's not a competition to see which department can do the best in their area of the game, but an active collaboration among all departments. The relationships that are probably the most important to the finished product take place in the second stage of game production, in which Testing and Creative Services simultaneously do their jobs, while going back to the imps for suggestions and problems they might have.



Creative Services and Testing each put in about four months of work in their areas.

Creative Services is responsible for packaging the game and all the neat things that go into the package. Carl Genatossio, Creative Services Manager, explains the process: "Elizabeth Langosy (Staff Writer), Angela Crews (Graphic Services Supervisor) and I play the game very early in testing for about a week to get the gist of it. We play just enough so that we can create packaging to reflect the world you're about to enter when you slip the disk into the drive. We meet with the imp to discuss what should go into the package as well. Since we've always made all-text products, we put all the graphics in the packaging. Everything in the packaging contains clues to something happening in the game."

Genatossio contracts artists and photographers for the package art, Langosy writes the text for the manuals and inserts and Crews pursues the physical objects placed in the game package. Later,

Continued on pg. 118

Testing

Testing a game is instrumental in releasing it to the public. At Infocom, the Testing department probably does more than similar departments in most other software companies. The complete testing process takes about four months and causes a lot of headaches for the testers. From internal errors to unexpected responses, these people have seen all of the bugs, errors and inconsistencies that Infocom games have had in their early stages.

Infocom games go through three testing stages — alpha, beta and gamma. Product Testing Manager Liz Cyr-Jones describes the transition from alpha to beta: "For a game to move out of alpha into beta, the game has to be clean — free of obvious typos and crashes. The story line has to be set, and all of the puzzles and characters and the real guts of the game have to be intact."

Beta and gamma testing are both done outside the company by unpaid volunteers. There is a group of about 15 people who test the games in these phases. They check for errors and play the game as much as possible. After correcting any remaining errors from the beta stage, the game is passed through gamma phase and is then ready for shipment to the stores.

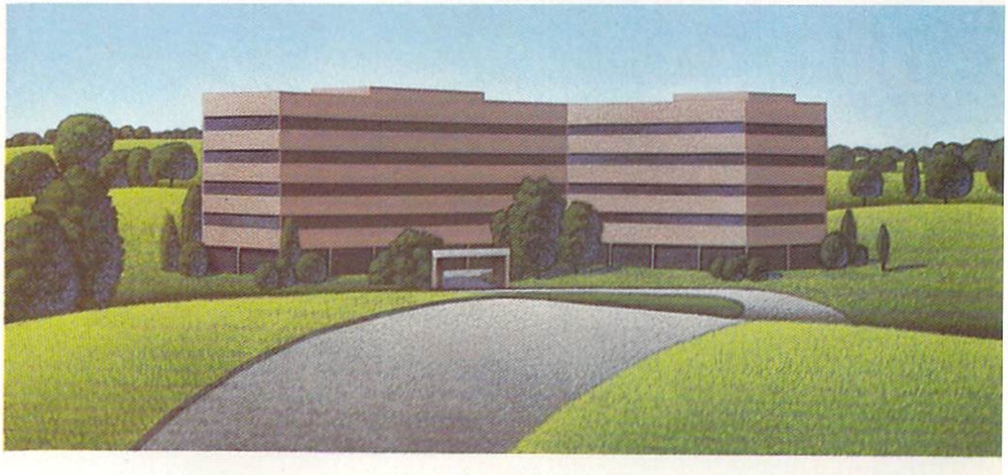
Sometimes errors still make it through the system, but after Testing is finished tearing a game apart, the final product is virtually flawless. The testers try 98% of the possible commands in the game and then continue to try more. Tester Gary Brennan remarks, "We try everything. We beat them to death." This lengthy process of finding the bugs and sending the game version back to the imp pays off in the end when a product is released with a certainty that most of the problems have been tested and corrected.

I used to think that game testers had an easy life, getting paid to play computer games all day. That misconception dissolved when I met this hardworking bunch. They are a collection of sharp minds who unceasingly explore a game from top to bottom. Max Buxton says that after finishing the testing process, boredom with the game results: "We'll get a game in early alpha and it'll be great. By late gamma, it's not the same—we never want to see that game again."

Each tester has his or her own approach to testing. Most agree that you determine your attitude toward a game the first time you play. The testers are given no instructions for playing a new product. They simply start the game and play it to see what it does. Often, it takes most of alpha to figure out what is going on.

Games that are received into Testing aren't necessarily complete, so testing involves a lot of interaction with the imps. When problems occur, the imps can come to the terminal to delve into the code of the game exactly where the problem occurs. Elements change from revision to revision like the weather. Besides the testing of a game, other duties include testing the computer version of the game on the PC's and evaluating other companies' games to keep from being burned out.

What are the toughest games that they've tested? Cyr-Jones claimed *Spellbreaker* was her toughest because the game was already hard and not knowing what to do only made it harder. Brennan picked *Nord and Bert Couldn't Make Head Or Tail Of It* because there was nothing to do in the game except for the wordplay and *Beyond Zork* because of the random geography that changes every time you play it. Buxton claimed *A Mind Forever Voyaging* was the toughest because the game takes place in a medium-sized town in five time zones and its geography and story line are very intricate. ■




Commodore
AMIGA
1. Computer Systems Associates
2. NewTek, Inc.
3. Ameristar Technologies, Inc.
4. Associated Computer Services
5. CalComp
6. Gold Disk Inc.
7. Anakin Research
8. Aegis Development Inc.
9. Mindware Inc.
10. University of Lowell (Zoxso)
11. Byte by Byte
12. Liquid Light
13. Commodore Business Machines Inc.
14. Software Visions Inc.
15. Micro-Illusions
16. Crystal Rose Software
17. Winners Circle System
18. Mimetics Inc.

by Tim Jones

SIGGRAPH '87

What do you get when you invite all of the major producers of graphic development software and hardware to one central California location? In addition to more traffic headaches in the Disneyland area, you get SIGGRAPH '87. From July 27-31, the Anaheim Convention Center was transformed into a carnival for computer graphics enthusiasts.

The conference was sponsored by the Association for Computing Machinery's Special Interest Group (SIG) on Computer Graphics (GRAPH). They brought together the industry leaders in the world of computer graphics and animation and presented exhibits, lectures and courses based on the world of computer graphics and animation.

Exhibits ranged from hands-on ease-of-use demonstrations, by Silicon Graphics, to static displays showing various pieces of hardware used to add or enhance graphics and animation capabilities. Lectures included a panel discussion with students from Los Angeles area schools who have created award-winning graphics projects and discussions on Ray Tracing Techniques (which included a presentation on Ray Tracing JELL-O™ brand Gelatin) and Surface Rendering (which involved more mathematics than I was prepared to digest). Courses ranged from beginner's level (Fundamentals and Overview of Computer Graphics) to the advanced level (Advanced Topics in Solid Modeling).

In the exhibit hall major corporations and small companies could show off their products to over 30,000 people at the five-day show. Among the exhibit booths of the many high-powered companies represented, including Cray Research, Apollo, Pixar, and Alias, was a very busy booth sponsored by Commodore Business Machines. Although most people in the business have yet to take a serious look at the new line of Commodore computers, it was hard for them to ignore Commodore's presence at SIGGRAPH. Aside from the actual Commodore-sponsored booth, companies like MicroIllusions (*Dynamic-Cad, Faery Tale Adventure*), Fairlight Instruments, Micro Magic (*Forms in Flight*) and The University of Lowell (MA) had booths of their own where major Amiga demonstrations were being held.

Included in the Commodore booth were exhibits by:

- Aegis Development
- Ameristar Technologies
- Anakin Research
- Associated Computer Services
- Byte by Byte
- CalComp
- Computer System Associates (CSA)
- Gold Disk, Inc.
- Liquid Light
- MicroIllusions
- Mimetics
- Mindware, Inc.
- NewTek
- Software Visions, Inc.
- University of Lowell (Zoxso)
- Winner's Circle System

Let's take a look at what each of these companies was demonstrating and what they have planned for the Amiga line in the near future.

Aegis Development

With a large area of the Commodore booth, Aegis Development was quite a hit with their new line of Desktop Video products, *VideoScape 3D* and *Video Titler*. Company personnel Bill Volk and Michelle Mehterian were among the Aegis people in attendance along with Allan Hastings, the author of *VideoScape 3D*. These packages allow for very complete design and control of 3D animation sequences. Even though the demonstrations presented by Aegis were very good, a programmer by the name of Leo Schwab grabbed the spotlight with his production of a take-off on a major corporation's animation sequence that he referred to as "The Dream Comes Alive." Leo's creation ran in real time with Aegis' *Sonix* music program performing the score on a one megabyte Amiga 2000 to the delight of thousands who came by the Commodore booth.

Ameristar Technologies

Ameristar Technologies' section of the booth was filled up with three Amiga 2000's and a SUN Series 3/100 minicomputer. They were using this setup to demonstrate their line of networking products. Included were methods by which the Amiga line can be networked with other existing systems via the Network File System (NFS) standard, developed by SUN Microsystems, which is an industry standard. They were also demonstrating an Amiga-to-Amiga (AFS) network which allows Amigas to share resources in the same manner as the higher priced mini and mainframe systems.

Ameristar's system allows for the use of Arcnet or Ethernet (also with Cheapernet interfaces available) with an Amiga, allowing the Amiga 2000 to operate with equipment from other vendors.

The key to the Ameristar networking ideals is that a network interface should be transparent to the user. They have accomplished this in their products for the Amiga 2000.

Anakin Research

Anakin Research demonstrated their pressure-sensitive graphics tablets known as the Easyl (pronounced "easel") for the Amiga 500 and 2000. The Easyl is a compact tablet that allows for full interaction with the Amiga in the same manner as the Amiga's mouse. When the Easyl's drivers are installed, the Easyl will send data from your pressing on its surface to your application as if it were coming from the mouse. The Easyl makes it much easier for most of us to produce art on the Amiga.

The demonstration was done from a Workbench environment using *DeluxePaint* from Electronic Arts. The unit is easy to install and takes up lit-

AL COLLETT

tle more desktop space than that required for normal, unhampered mouse operation.

Associated Computer Services

Associated's Keith Masavage was at SIGGRAPH demonstrating their *E/FX* package. This is a storyboard-based animation package that allows development of presentations in a very easy to use and edit format. The demonstrations being shown involved newscast-grade animated weather maps and animated corporate graphics examples.

E/FX is a very high-powered system that was not designed with the hobbyist in mind. Its main thrust is in two-dimensional animation (unlike the majority of products introduced) for use in boardroom and television presentation fields.

Byte by Byte

Byte by Byte took advantage of SIGGRAPH to introduce their Ray Trace/3D design package — *Sculpt 3D*. *Sculpt 3D* is a straight-forward editor that allows generation of three-dimensional objects and then creates full ray-traced images of these objects. In its current version, there is no way to animate the objects, but Byte by Byte has promised that an animation package will be coming in the near future.



The user/design interface of *Sculpt 3D* was one of the most intuitive of all of those shown. The menus and function names can be recognized by a novice, as well as a seasoned professional, making the learning curve of this package less steep.

CalComp

CalComp has been manufacturing plotters for the professional computer marketplace for quite a while. They were at the Commodore booth demonstrating their line of color plotters. These plotters are priced in line with most other Amiga peripherals, which adds to their attractiveness to Amiga owners. The images produced are very sharp and very close to the colors actually displayed on the Amiga's screen. The driver used in the demonstrations showed none of the bugs that were present in many of the drivers for the array of color printers released for the Amiga at earlier dates. This shows that CalComp has a true dedication to the development of a fully-compatible line for the Amiga.

Computer System Associates

CSA has developed a line of products that will allow the Amiga family to move up in performance to that of the much higher priced mini's on the market. The new line of Turbo-Amiga products promises to be the highlight of the hardware world for Amiga owners, both present and future.

While many other companies are dropping their expansion systems for the Amiga 1000, CSA is introducing the Amiga Highrise, an Amiga 2000-compatible expansion chassis that alleviates the need for a 1000 owner to purchase a 2000 for the expandability. The Highrise can use any of the Zorro standard cards being designed for the Amiga 2000 as well as the IBM-XT Bridgeboard and four XT expansion boards. They have also designed 512K and 2 MB Static RAM boards for use in the Highrise and the Amiga 2000 with their 68020 devices. Other products include a SCSI DMA device interface and a secure disk system for the storage of sensitive data.

Their line also includes a series of 68020/68881-based systems for the entire Amiga family. This includes a piggyback unit for the 500 and 1000 and a full-slot card for the Highrise and the 2000. Their entire product line is designed specifically to enhance the performance of the Amiga to a level above and beyond that of any microcomputer available at the present time.

Gold Disk, Inc.

Kalish Ambwani and Alexandra Peace were manning the booth for Gold Disk and showing off their coup de grace — *Professional Page*. *Professional Page* is a very powerful step up from the company's entry into the desktop publishing market — *Pagesetter*. While *Pagesetter* was a full-featured package, *Professional Page* goes the extra mile and gives the user the ability to use color separation techniques for the creation of "magazine-quality color documents" and use of the system with high-level typesetting units for up to 2400 dots-per-inch images.

They have kept the interface for *Professional Page* as uncluttered as it was for *Pagesetter*, but have increased the functionality and performance greatly. While *Pagesetter* gave user groups an easy method for creating a newsletter, *Professional Page* may just cause an outbreak of user group *magazines!*

Liquid Light

Liquid Light set up their area of the Commodore booth with their image capturing package based on the Polaroid Palette hardware. Their package allows a user to grab a screen and transfer it to film media, from Polaroid instant to high-quality 35mm slides. The images produced were very sharp due to a dithering effect done by the software while exposing the film negative. This basically involves exposing the film, shifting the image (figuratively) down a half-pixel and then re-exposing the film. The resulting image doesn't appear computer generated due to the lack of tell-tale dots and scan lines.

MicroIllusions

MicroIllusions was represented at SIGGRAPH both in the Commodore booth and in their own booth. They were demonstrating quite a few products, including *Dynamic-Cad* and their new Photon Video Series. Of the Photon Series, the module being shown in its fullest was the *Cell Animator*. This module, and the entire series, is being designed to take full advantage of the various types of graphics files available on the Amiga. You can take objects and drawings designed under other companies' packages and incorporate them into all phases of the Photon production series.

The *Cell Animator* is based on the long-standing "page-flipping" technique for animation. Using this technique, the artist/animator draws a frame, stores it, makes slight changes, and stores it, until a full series

Continued on pg. 112

COMMODORE 64 and AMIGA

GRAPHICS CONTEST

Commodore Magazine is sponsoring our third Graphics Contest. This year we have added an Amiga category for aspiring Amiga artists out there, in addition to the Commodore 64 category. Winners will receive a cash prize and the winning graphics screens will be published in the June, 1988 issue of ***Commodore Magazine.***

Commodore 64 Category Prizes
Grand Award: $500 and Publication in *Commodore Magazine*
Five Runners Up: $100 and Publication in *Commodore Magazine*
Honorable Mention: Publication in *Commodore Magazine*

Amiga Category Prizes
Grand Award: $500 and Publication in *Commodore Magazine*
Five Runners Up: $100 and Publication in *Commodore Magazine*
Honorable Mention: Publication in *Commodore Magazine*

GRAPHICS CONTEST RULES

1. This contest is strictly for amateur artists. Anyone who derives more than 10% of their annual income from the sale of original artwork is ineligible.
2. Employees of Commodore Magazine, Inc., Commodore Business Machines, Inc., Commodore Electronics Ltd., Commodore International Ltd., their advertising and promotional agencies and their immediate families are not eligible to enter this contest.
3. Each entry must be wholly the product of the developer in whose name the entry has been submitted. Copyrighted images are not eligible. This includes record album covers, movie figures, famous paintings and cartoon characters. Outside assistance is expressly prohibited and will provide cause for disqualification.
4. A maximum of two screens per person is allowed. You may submit either two screens for one computer or one screen for each computer. If a contestant submits more than two screens for consideration, all of that person's entries will be invalidated.
5. All entries must be submitted on disk, 1541 format for the Commodore 64 and 3.5-inch format for the Amiga, with the following marked clearly on the disk's label:

a. Contestant's name, address and phone number
b. Picture title(s)
c. Graphics package or programming aid used to create the graphics
d. The words "GRAPHICS CONTEST"

A photo of the screen display or a printed copy of the screen does not constitute an acceptable entry.
6. Mail entries before January 31, 1988 to *Commodore Magazine,* 1200 Wilson Drive, West Chester, PA 19380, ATTN: GRAPHICS CONTEST.

GENERAL CONDITIONS

> Graphic screens are judged on originality, creativity and best use of the computer's unique graphics features.
> Entries will be judged by the staff of *Commodore Magazine.*
> Make sure your mailer will protect your disk from damage. Affix sufficient first-class postage. Mail your disk and the official entry blank to the address shown above in time to reach us by the January 31, 1988 deadline.
> Entries become the property of *Commodore Magazine,* which reserves the right to adapt, use or publish all entries received. No disks will be returned, so be sure to make a copy of your entry before you submit it to the contest.
> Non-winning entries will not be acknowledged. Winners will be notified by February 28, 1988. Taxes on cash prizes are the winners' responsibilities.

PLEASE PRINT

NAME ____________ PHONE ____________
ADDRESS ____________
CITY ____________ STATE ____________ ZIP ____________
AGE ______ SIGNATURE ____________
PARENT'S SIGNATURE (IF CONTESTANT IS UNDER 18) ____________
PICTURE TITLE #1 ____________ COMPUTER ____________
GRAPHICS PACKAGE OR PROGRAMMING AID USED ____________
PICTURE TITLE #2 ____________ COMPUTER ____________
GRAPHICS PACKAGE OR PROGRAMMING AID USED ____________

DEADLINE FOR ENTRY: JANUARY 31, 1988. MAXIMUM 2 SCREENS PER CONTESTANT.

by Joseph M. Schwartz

Castrovia

For the Commodore 64

Many centuries ago warring overlords battled for control of the land of Castrovia and its people. This two player strategy game for the 64 tests you and your army's ability to conquer your opponent and become sole ruler of Castrovia.

Castrovia is a grid-based war game where you must develop and implement defensive and offensive strategies in order to remove all your opponent's troops from the board.

The Land and People of Castrovia

At the beginning of every game the computer will randomly construct a map of the playing field. If the map is satisfactory to both players the game will proceed. If not, the computer will construct another.

There are three different terrain categories. Each quadrant is identified by a letter and a number (Example: quadrant A6). The quadrant is described by the letter at its center: "F" for farmland, "S" for swampland and "L" for a lake. The population of the quadrant is indicated by the number (in hundreds) to the left of the describing letter. The number of occupying troops is indicated by the number to the right of the letter. Thus, if quadrant A6 reads "5F3," then it is farm land with a population of 500 people, occupied by three troops. Swamps and lakes always have zero populations. The player controlling a quadrant is indicated.

There are three special quadrants: the two players' castles and the capitol. The capitol is always at quadrant 5E while the position of the castles changes. Each player starts out with nine troops.

Moving and Combat

When it is your turn the computer will first ask the quadrant *from* which you want to move troops. Enter the quadrant coordinates, letter then number. You don't have to press RETURN. Then enter the quadrant *to* which you want to move troops. You will then specify the number of troops to be moved (between zero and nine). The computer will check to see if you have sufficient troops at the *from* position and if the number of your troops in the *to* quadrant will not be greater than nine. Players may occupy farm lands, castles, swamps and the capitol, but never lakes.

If you move into an unoccupied quadrant you automatically gain control of that quadrant. If you try to move into a quadrant occupied by your opponent, combat will commence. Your attacking force is based on the number of troops moving into the quadrant. The defending force is based on the number of troops in the quadrant plus an amount proportional to the population present. The combat is resolved based on probabilities. Castles and the capitol are fortified and are thus twice as defendable as a regular quadrant.

Taxes and News Reports

Every five turns or so the year will end and players will collect taxes. Players receive one *barble* (the Castrovian unit of currency) for every person in the areas they control. Thus, a player who controls A6 ("5F3"), would receive 500 barbles from that quadrant. With this money you can buy troops at a cost of 1000 barbles per troop (2000 barbles if you wish to place them directly in your castle). All troops outside the castle must be placed in a single quadrant already under your control. For example, a player with 8,000 barbles buys one troop for his castle and six for quadrant A6. Any money not spent on troops is kept in the players' treasuries. This money earns interest at the rate of 10% each year. If you have lost control of your castle you cannot collect taxes or buy troops.

The game is user friendly so the best way to become good at it is to play it. ◼

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Castrovia

```
10 P=1:DL=1500:SS=54272:C$(0)=""
   :C$(1)="[CYAN]":C$(2)="[YELLOW]
   "'GKAJ
15 A$(0)="F":A$(1)="S":A$(2)="L"
   :A$(3)="C"'EXNK
17 A$(4)="X":POKE 53280,0
   :POKE 53281,0'DVIK
20 PRINT"[CLEAR,DOWN4,SPACE15,GRAY2]
   CASTROVIA"'BAIE
25 GOSUB 900'BDME
30 PRINT"[CLEAR,WHITE](LIMIT SIX
   LETERS)"'BAVF
35 INPUT"NAME OF PLAYER ONE";N1$
   :IF LEN(N1$)>6 THEN 35'FNSO
40 INPUT"NAME OF PLAYER TWO";N2$
   :IF LEN(N2$)>6 THEN 40'FNPK
45 DIM M (9,9),P(9,9),T(9,9),C(9,9),
   R(2)'BHAL
50 PRINT"[CLEAR]SETTING UP MAP"
   :S=1'CDMH
55 FOR Y=1 TO 9:FOR X=1 TO 9'GHIL
60 N=INT(40*RND(1)+1)'FJUH
65 M(X,Y)=0'BHRJ
70 IF N<8 THEN M(X,Y)=1'EJAH
75 IF N<4 THEN M(X,Y)=2'EJWM
80 P(X,Y)=0'BHUG
85 IF M(X,Y)=0 THEN P(X,
   Y)=INT(9*RND(1)+1)'IUSS
90 T(X,Y)=0:C(9,9)=0'CPCJ
95 NEXT X,Y'BDTL
100 M(5,5)=4'BHAW
105 P(5,5)=INT(5*RND(1)+5)'FNKF
110 GOSUB 430'BDKW
115 GOSUB 490:PRINT"IS THIS MAP
    ALRIGHT FOR BOTH[SPACE12]
    PLAYERS (Y/N)?"'CEIP
120 GET A$:IF A$="Y"THEN S=0
    :GOTO 135'GLPD
125 IF A$="N"THEN PRINT"[CLEAR]"
    :GOTO 50'FFLG
130 GOTO 120'BDCY
135 GOSUB 490:PRINT"PLACING CASTLES"
    :FOR X=1 TO 500:NEXT X'GMWN
140 X1=INT(9*RND(1)+1):Y1=INT(9*RND(1)
    +1)'KTHJ
145 Y1=INT(9*RND(1)+1)'FJMJ
150 IF M(X1,Y1)<>0 THEN 140'EMFF
155 M(X1,Y1)=3:C(X1,Y1)=1
    :T(X1,Y1)=9'DELN
```

```
160 X2=INT(9*RND(1)+1):Y2=INT(9*RND(1)
    +1)'KTJL
165 IF M(X2,Y2)<>0 THEN 160'EMJL
170 M(X2,Y2)=3:C(X2,Y2)=2
    :T(X2,Y2)=9'DESK
175 GOSUB 490:PRINT"[CYAN]";
    N1$"'S CASTLE IS AT[SPACE2]
    "CHR$(X1+64);Y1'ERIS
180 PRINT"[YELLOW]";N2$"'S CASTLE IS
    AT[SPACE2]"CHR$(X2+64);Y2'DNPM
185 X(1)=X1:X(2)=X2:Y(1)=Y1:Y(2)=Y2
    :N$(1)=N1$:N$(2)=N2$'GUSW
190 GOSUB 430:P=2:N$=N2$
    :C$="[YELLOW]"'EPIK
195 X=INT(4*RND(1)+1):IF X=4 THEN
    210'IOSR
200 IF P=2 THEN P=1:N$=N1$:C$="[CYAN]"
    :GOTO 210'HRBE
205 IF P=1 THEN P=2:N$=N2$
    :C$="[YELLOW]"'GNPI
210 GOSUB 490:PRINT C$N$" MOVES ---
    FROM ";'CJAD
215 LA=65:HA=73:GOSUB 840'DNKG
220 FX=ASC(A$)-64'DIYB
225 LA=49:HA=75:GOSUB 840'DNOH
230 FY=VAL(A$)'CGDB
235 PRINT:PRINT"[SPACE17]TO ";'CCOI
240 LA=65:HA=73:GOSUB 840'DNKE
245 TX=ASC(A$)-64'DINI
250 LA=49:HA=57:GOSUB 840'DNOF
255 TY=VAL(A$)'CGRI
260 IF C(FX,FY)=P THEN 275'DMGG
265 GOSUB 490:PRINT"YOU HAVE NO
    TROOPS THERE! - TRY AGAIN"
    :FOR X=1 TO DL:NEXT X'GLCX
270 GOTO 210'BDCE
275 IF ABS(FX-TX)<=1 AND
    ABS(FY-TY)<=1 THEN 290'LRLT
280 GOSUB 490:PRINT"YOU CAN ONLY MOVE
    INTO AN ADJACENT[SPACE6]QUADRANT";
    'CFJS
285 PRINT" -- TRY AGAIN":FOR X=1 TO DL
    :NEXT X:GOTO 210'GLES
290 IF M(TX,TY)<>2 THEN 305'EMFK
295 GOSUB 490:PRINT"YOU CAN'T MOVE
    INTO A LAKE -- TRY AGAIN"'CEMV
300 FOR X=1 TO DL:NEXT X:GOTO 210'FKOC
305 GOSUB 490:PRINT"HOW MANY TROOPS
    TO MOVE -- ";'CFYL
310 LA=48:HA=57:GOSUB 840'DNNC
315 MN=VAL(A$)'CGYF
320 IF MN=0 THEN PRINT" OK"
    :GOTO 415'FHVE
325 IF T(FX,FY)=>MN THEN 340'ENMJ
330 GOSUB 490:PRINT"NOT ENOUGH
    TROOPS! -- TRY AGAIN"
    :FOR X=1 TO DL:NEXT X'GLHO
335 GOTO 290'BDKG
340 IF NOT(C(TX,TY)=P AND T(TX,
    TY)+MN>9)THEN 355'HAJL
345 GOSUB 490:PRINT"THIS WOULD RESULT
    IN MORE THAN NINE[SPACE5]
    TROOPS IN A";'CFAV
350 PRINT" QUADRANT - TRY AGAIN"
    :FOR X=1 TO DL:NEXT X
    :GOTO 290'GLCN
355 PRINT" OK":T(FX,FY)=T(FX,
    FY)-MN'DTMO
360 IF T(FX,FY)=0 THEN C(FX,FY)=0'ESBK
365 IF C(TX,TY)=0 OR C(TX,
    TY)=P THEN T(TX,TY)=T(TX,TY)+MN
    :C(TX,TY)=P:GOTO 415'JATB
370 GOSUB 490:PRINT"A BATTLE!!"
    :GOSUB 900'DITJ
375 DS=T(TX,TY)+(.5*P(TX,TY))'DWMQ
380 IF M(TX,TY)=3 OR M(TX,
    TY)=4 THEN DS=DS*2'HXBP
385 DV=INT(DS*RND(1))'EJJO
390 AV=INT(MN*RND(1))'EJKK
395 IF AV=DV THEN T(TX,TY)=0
    :C(TX,TY)=0:GOTO 415'GCDV
400 IF DV>AV THEN T(TX,TY)=T(TX,
    TY)-AV'FWQH
405 IF AV>DV THEN T(TX,TY)=MN-DV
    :C(TX,TY)=P'GBLO
410 IF T(TX,TY)<1 THEN T(TX,TY)=1'ESBG
415 GOSUB 430:GOSUB 490'CHKG
420 TU=TU+1:IF TU>(INT(7*RND(1)+3))
    THEN TU=0:GOSUB 505'LYDM
425 GOTO 195'BDOG
430 PRINT"[HOME,GRAY2,SPACE4]A[SPACE3]
    B[SPACE3]C[SPACE3]D[SPACE3]E
    [SPACE3]F[SPACE3]G[SPACE3]H
    [SPACE3]I"'BAII
435 PRINT" [CMDR A,SHFT C36,CMDR S]
    "'BASK
440 R(1)=0:R(2)=0:FOR Y=1 TO 9'FPWI
445 IF Y<>1 THEN PRINT" [SHFT B,
    SPACE36,SHFT B]"'FCWQ
450 PRINT CHR$(Y+48)"[SHFT B]";'DGEH
455 FOR X=1 TO 9'DDCK
460 PRINT C$(C(X,Y));P(X,Y);"[LEFT]";
    A$(M(X,Y));CHR$(T(X,Y)+48);"
    [GRAY2]";'DRKQ
465 R(C(X,Y))=R(C(X,Y))+T(X,Y)
    :NEXT X'DBAR
470 PRINT"[SHFT B]":NEXT Y'CCMH
475 PRINT" [CMDR Z,SHFT C36,CMDR X]
    "'BAFO
480 IF(R(1)=0 OR R(2)=0)AND S=0 THEN
    855'HRMO
485 RETURN'BAQL
490 PRINT"[HOME,DOWN21]";'BBAJ
495 FOR X=1864 TO 2023:POKE X,32
    :NEXT X'FQAS
500 RETURN'BAQY
505 GOSUB 490:PRINT"YEAR END TAX
    REPORTS":TA(1)=0:TA(2)=0'ESXP
510 FOR Y=1 TO 9:FOR X=1 TO 9'GHIF
515 IF C(X,Y)=1 THEN TA(1)=TA(1)
    +100*P(X,Y)'GBCO
520 IF C(X,Y)=2 THEN TA(2)=TA(2)
    +100*P(X,Y)'GBFK
525 NEXT X,Y'BDTH
530 FOR PP=1 TO 2:PRINT C$(PP)'ELFH
535 IF C(X(PP),Y(PP))=PP THEN 560'DTNN
540 GOSUB 490:PRINT"ATTENTION "N$(PP)
    :FOR X=1 TO DL:NEXT X'GRYN
545 GOSUB 490:PRINT"YOU CAN'T COLLECT
```

```
     TAXES OR BUY TROOPS[SPACE3]IF ";
     'CFQV
550 PRINT"YOU'RE NOT IN CONTROL OF
     YOUR CASTLE":FOR X=1 TO DL
     :NEXT X'FHJS
555 GOTO 770'BDNK
560 GOSUB 490:PRINT N$(PP)"
     COLLECTED"TA(PP)"BARBLES"'CQJO
562 PRINT"IN TAXES THIS YEAR"'BAPM
565 FOR X=1 TO DL:NEXT X
     :GOSUB 490'FKDP
570 I(PP)=INT(.1*BA(PP))'DPML
575 PRINT"AND EARNED"I(PP)"BARBLES IN
     INTEREST"'BFGU
580 FOR X=1 TO DL:NEXT X'EGEL
585 BA(PP)=BA(PP)+I(PP)+TA(PP)'DXXT
590 GOSUB 490:PRINT N$(PP)"'S NEW
     BALANCE IS"BA(PP)"BARBLES"'CQQT
592 FOR X=1 TO DL:NEXT X'EGEO
595 GOSUB 490'BDQO
600 PRINT"HOW MANY CASTLE TROOPS DO
     YOU"'BAQI
603 PRINT"WANT TO BUY (2000 BARBLES
     EACH)";'BBVL
605 LA=48:HA=57:GOSUB 840'DNNJ
610 A=VAL(A$):IF A*2000<=BA(PP)THEN
     625'HUEJ
615 GOSUB 490:PRINT"YOU DON'T HAVE
     ENOUGH MONEY!":FOR X=1 TO DL
     :NEXT X'GLOT
620 GOTO 595'BDSD
625 IF A=0 THEN 660'DFPJ
630 IF T(X(PP),Y(PP))+A<10 THEN
     650'EUWK
635 GOSUB 490:PRINT"YOU CAN'T HAVE
     MORE THAN NINE TROOPS IN A
     QUADRANT!";'CFHX
640 PRINT" - TRY AGAIN":FOR X=1 TO DL
     :NEXT X'FHDL
645 GOTO 595'BDSK
650 T(X(PP),Y(PP))=T(X(PP),Y(PP))+A
     :BA(PP)=BA(PP)-(2000*A)'FYCT
655 GOSUB 490:PRINT C$(PP)"YOUR NEW
     BALANCE IS"BA(PP)"BARBLES"'CQUV
658 FOR X=1 TO DL:NEXT X'EGER
660 GOSUB 490'BDQH
665 PRINT"HOW MANY REGULAR
     TROOPS"'BAPS
667 PRINT"DO YOU WISH TO BUY (1000
     BARBLES EACH)";'BBDX
670 LA=48:HA=57:GOSUB 840'DNNL
675 A=VAL(A$):IF A*1000<=BA(PP)THEN
     690'HUAV
680 GOSUB 490:PRINT"YOU DON'T HAVE
     ENOUGH MONEY!":FOR X=1 TO DL
     :NEXT X'GLOV
685 GOTO 660'BDLO
690 IF A=0 THEN 770'DFRL
695 GOSUB 490:PRINT"WHERE DO YOU WANT
     TO PUT THEM ";'CFLY
700 LA=65:HA=73:GOSUB 840'DNKF
705 XX=ASC(A$)-64'DIRJ
710 LA=49:HA=57:GOSUB 840'DNOG
715 Y=VAL(A$)'CFIJ
720 IF C(XX,Y)=PP THEN 735'DMKH
725 GOSUB 490:PRINT"YOU CAN NOT PUT
     TROOPS WHERE YOU DO NOT[SPACE2]
     HAVE ANY!"'CEAX
730 FOR X=1 TO DL:NEXT X:GOTO 695'FKGJ
735 IF T(XX,Y)+A<=9 THEN 755'FMDP
740 GOSUB 490'BDQG
742 PRINT"YOU CAN NOT HAVE MORE THAN
     NINE TROOPS[SPACE2]
     IN ANY QUADRANT"'BALW
745 FOR X=1 TO DL:NEXT X'EGEO
750 GOTO 660'BDLH
754 IF XX=X(PP)AND Y=Y(PP)THEN GOSUB
     490'GQLS
755 IF XX=X(PP)AND Y=Y(PP)THEN GOSUB
     490:GOSUB 1000'HVVU
760 IF XX=X(PP)AND Y=Y(PP)THEN
     PRINT"YOUR CASTLE":FOR X=1 TO DL
     :NEXT X:GOTO 660'LYAX
765 T(XX,Y)=T(XX,Y)+A:BA(PP)=BA(PP)
     -1000*A:GOSUB 490'GMAY
770 NEXT PP'BCIJ
775 Z=INT(20*RND(1)+1):PRINT"[GRAY2]";
     'GLWT
780 IF Z=1 THEN GOSUB 490
     :PRINT"ALL TREASURIES
     MYSTERIOUSLY DOUBLE"'FGDX
785 IF Z=1 THEN BA(1)=BA(1)*2
     :BA(2)=BA(2)*2'HAWX
790 IF Z=2 THEN GOSUB 490
     :PRINT"ALL TREASURIES
     MYSTERIOUSLY DISAPPEAR"'FGXA
795 IF Z=2 THEN BA(1)=0:BA(2)=0'FPUV
800 IF Z=3 THEN GOSUB 490
     :PRINT"REVOLUTION IN CAPITOL"'FGWM
805 IF Z=3 THEN PRINT"ALL TROOPS
     KILLED":T(5,5)=0:C(5,5)=0'GSGT
810 IF Z<>4 THEN 830'EFPG
814 GOSUB 490'BDQI
815 PRINT"CASTLE TROOP'S DISEASE
     KILLS HALF OF[SPACE4]
     ALL CASTLE TROOPS"'BADX
820 T(X1,Y1)=INT(T(X1,Y1)/2)
     :IF T(X1,Y1)=0 THEN C(X1,
     Y1)=0'HNTR
825 T(X2,Y2)=INT(T(X2,Y2)/2)
     :IF T(X2,Y2)=0 THEN C(X2,
     Y2)=0'HNCW
830 IF Z>4 THEN GOSUB 490
     :PRINT"NO NEWS IS GOOD NEWS"'FGRO
835 GOSUB 430:RETURN'CEKL
840 GET A$:IF A$=""THEN 840'EILK
845 IF ASC(A$)<LA OR ASC(A$)>HA THEN
     GOTO 840'IPUT
850 PRINT A$;:RETURN'CEBJ
855 PRINT"[CLEAR]":IF R(1)=0 THEN W=2
     :W$=N2$:L$=N1$:GOTO 865'IYYW
860 W=1:W$=N1$:L$=N2$'DORN
865 PRINT"[GRAY2]"W$" HAS BEATEN
     "L$'BERS
870 PRINT"[DOWN3]FINAL
     STATISTICS"'BALO
875 PRINT"[CMDR Y16]":PRINT"[DOWN]
     "'CBCB
```

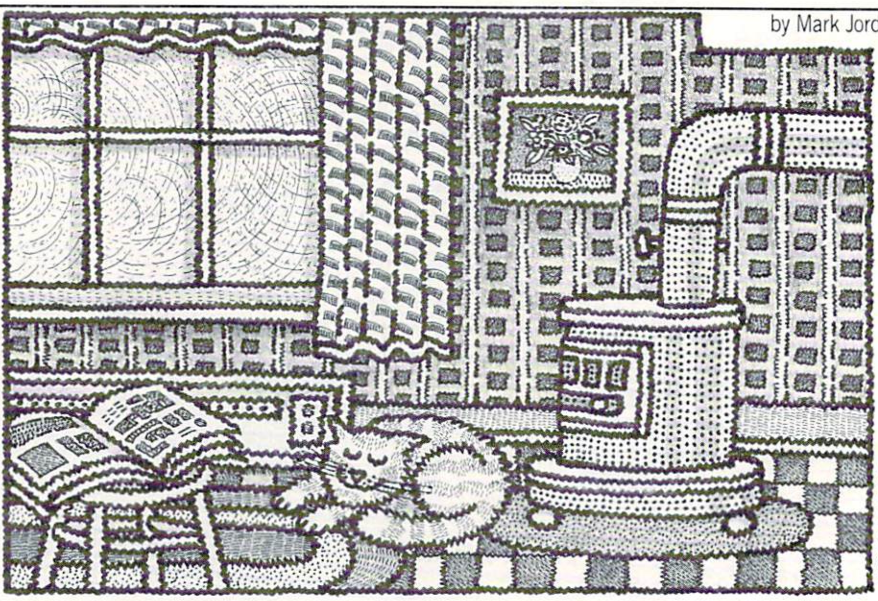
Continued on pg. 90

by Mark Jordan

The 128 Mode

Fuel-Gauge 128

Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical —but we guarantee that they will spark your creativity.



As I sit at my keyboard I can hear the howl of the north wind at the window — winter approaches. I look to my right and see a lifeless, black woodstove. I look to my left and see a stark, white electric baseboard heater. I look about 72 degrees to my left again and discover a forlorn kerosene heater. Lying next to it is a Sears Home Catalog opened to the furnace section. My brain is burning with the question:

WHAT IS THE CHEAPEST WAY TO HEAT THIS PLACE?

Find the answer by typing in the two listings that follow. You'll need to type and save "Listing Two" and then run it once before using the main program. This will save the sprite data to the disk. You'll need to save the sprite data listing with the filename "fuel sprites" and be sure it's on the same disk as your program.

Fuel-Gauge allows you to compare the operating costs of each of the four major types of fuels — wood, oil, gas, and electricity — in two ways. You can compare the cost per therm (more on that later) or you can compare the cost per year for your house. And there's more: you can get a very good approximation of what your next energy improvement will save you in dollars per year.

Fuel-Guage's spreadsheet consists of three rows of four columns. The top row of the screen contains your fuel options in the form of sprites: wood, oil, gas, and electricity. The second row deals with options specific to the fuel type chosen in row one. The third row deals mainly with factors specific to your house, your heater and your climate.

Here's how it works: using your cursor keys, move the cursor to the sprite you want and press RETURN. Let's say you chose wood. A second wood sprite will slide down from row one to the first slot on row two as a reminder of your choice. Also, beneath it will be the term used for the base unit of that particular fuel. For wood, the base unit is a cord.

Now, moving from left to right, go to the second column on row two entitled "Unit Price" and press RETURN. For wood in my area, an average price per cord is $85. So type that in.

Next move left to the next column, "Therms per unit" and press RETURN. A therm is one hundred thousand BTUs, (British thermal units) the smallest measure of heat that heating engineers deal with. So a therm is just a bunch of BTUs.

Oops, I forgot to warn you: with gas there is a sub-option: whether you want to measure natural or LP gas. The program defaults to natural, so if that's what you want to compare, no problem. If you want to compare the cost of LP, you'll need to press "L" just after you choose the gas icon. (The main difference between the two is the basic units: natural gas comes in CCFs — hundred cubic feet — while bottled gas (LP) comes in gallons.)

You can do the same for electricity, though if you live in northern Indiana or anywhere outside of government subsidized electricity (this is a sore spot with me and I don't mind you folks in the Northwest knowing it), figuring for electric heat is mainly for laughs — bitter ones. Example: to heat my home with electric my winter fuel bill would be close to $2000. I'm not sure but I think I could get just as much heat by burning two thousand one dollar bills.

Now you know which fuel is cheapest. It's probably wood first, gas second, then oil, then electricity. How much will that calculate out to in one year? Let's go down to row three and find out.

The first column allows you to adjust the efficiency of your heating unit. The default values were chosen because they are generally accepted as accurate within the industry. They are: wood — 60% efficient, oil — 80%, gas — 85%, and electricity — 100%. But each of these figures is subject to change. For example, you could get a highly efficient woodstove with a catalytic converter. That might up your efficiency to 80%. Or you might get one of those 99% efficient pulse gas furnaces. Or if you're using electricity, the 100% figure applies only to baseboard units. If you've got an electric furnace, some heat is lost in the ductwork.

Don't be too concerned about precision in rating your heater. Unless you know otherwise, use the default values.

Next column is "House Efficiency." The help screen will help you determine how efficient your house is. Basically, if you've got a weather-tight, super-insulated house, figure 100%. If you live in Uncle Joe's old uninsulated farmhouse where the curtains rustle in the breeze even with the windows down, figure 30%. The default is 75%.

The third column is "Total Area." Just type in the approximate square footage of floor space in your house.

Finally, column four asks for the degree days in your area. Fortunately, a help screen gives you nine locations in the U.S. to use as a guide. If you need to be more exact, or can't extrapolate from the data given, or live in another country, just call the local weather bureau.

Once you have entered all the data on the bottom row the top row will now light up with more information under each sprite-icon. This information is the total annual fuel costs estimated for your house using each fuel.

Continued on pg. 84

Continued from pg. 82

Wonderful! But first, let's fine-tune it a bit. Suppose you happen to know that your house costs $700 to heat last winter with natural gas but the top row says it should cost $800. You should adjust the house efficiency number until your cost reads close to $700. (Be sure you're using last winter's CCF price.) This way you can be sure that the other fuel calculations are accurate.

Now you can compare at a glance the amount of money you would have to spend on each of the four main fuel choices. But you can do much more. Suppose for example you have been thinking of installing a new, highly-efficient gas furnace. Is it worth it? Well, just change the heater efficiency number to reflect the higher rating and compare results.

Or suppose you're considering insulating the house and putting in new storm windows. That would likely up your House Efficiency at least 20%. Try that and see how much you'll save.

Or you may be thinking of adding another room. How much will it cost to heat it? Just add the Total Area and let the program show you.

If you were reading this at the same time of year that I wrote it — July, in the middle of a heat wave — you might not think it all that useful. But it is winter now, and the north wind is beginning to blow. What better time than now to check your Fuel-Gauge. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Listing Two

```
10 FOR T=0 TO 255:READ A$
   :POKE 3584+T,DEC(A$):NEXT'IUVG
20 FOR T=0 TO 41:POKE 3840+T,255
   :POKE 3840+T+42,0:NEXT'JAKI
30 BSAVE"FUEL SPRITES",B0,
   P3584 TO P4096'CPRH
40 DATA C1,80,00,C1,80,00,63,00'BXWE
50 DATA 00,6B,73,80,7F,4A,56,36'BXNG
60 DATA 4A,51,00,39,D1,00,00,1E'BXJH
70 DATA 00,00,00,00,00,00,18,00'BXQH
80 DATA 00,7B,C0,06,FB,FC,3F,E7'BXKJ
90 DATA C1,FF,1E,3F,FF,01,FF,FC'BXRK
100 DATA 0F,FF,F3,67,FF,9F,F7,FC'BXAA
110 DATA 7E,F7,E0,08,76,00,00,00'BXAB
120 DATA 00,00,00,00,00,07,00,00'BXOB
130 DATA 1C,00,F8,30,03,FE,60,07'BXND
140 DATA FF,C2,03,FF,00,04,7C,81'BXCE
150 DATA 07,83,81,3B,FF,80,66,7F'BXRF
160 DATA 80,45,BF,80,45,AF,80,46'BXHG
170 DATA 6F,80,47,EB,80,67,EB,80'BXFH
180 DATA 3B,FB,80,07,F8,80,07,FF'BXQI
190 DATA 80,03,FF,00,00,7C,00,00'BXIJ
200 DATA 00,06,00,00,0C,00,00,1C'BXCA
210 DATA 00,00,38,00,00,78,00,00'BXIB
220 DATA 78,00,00,FC,00,00,FC,00'BXYD
230 DATA 3D,C6,3C,41,82,40,41,BB'BXGE
240 DATA 78,4D,83,04,45,BB,04,39'BXQF
250 DATA BB,78,00,FF,00,00,FE,00'BXOG
260 DATA 00,7E,00,00,7C,00,00,3C'BXDH
270 DATA 00,00,38,00,00,18,00,00'BXCH
280 DATA 00,00,00,00,00,00,00,08'BXPI
290 DATA 80,00,49,00,00,25,00,00'BXKJ
300 DATA 10,00,FF,FB,FF,00,00,00'BXFC
310 DATA 00,15,00,00,24,80,00,44'BXKC
320 DATA 00,00,00,00,00,00,00,00'BXHD
330 DATA 00,00,00,00,00,00,00,00'BXHE
340 DATA D3,7D,D6,92,49,54,D3,49'BXVG
350 DATA 94,92,49,54,DB,69,56,00'BXLH
```

END

Fuel-Gauge 128

```
20 FM$(0)=" [SHFT C]ORDS "
   :FM$(1)="[SHFT G]ALLONS"
   :FM$(3)=" [SHFT K,SHFT W,SHFT H]S
   [SPACE2]":NA$(5)=" [SHFT C2,SHFT F]
   S[SPACE2]":NA$(6)="[SHFT G]ALLONS"
   :FM$(2)=NA$(5):NA(5)=1:NA(6)=.93
   :TH=2.8E-04'KWEI
30 Z1$="[RVS]$[RVOFF]###.##"
   :Z2$="[RVS] [RVOFF]#####%"
   :Z3$="[RVS] [RVOFF]###.##"
   :Z4$="[RVS] [RVOFF]######"'EPAL
40 F$(1,1)=Z1$:F$(1,2)=Z3$:F$(1,3)=Z1$
   :F$(2,0)=Z2$:F$(2,1)=Z2$
   :F$(2,2)=Z4$:F$(2,3)=Z4$
   :F$(1,0)="[UP,RVS]####.#"'IJHX
50 FOR FU=0 TO 3:READ VB(FU,0)
   :VB(FU,1)=75:NEXT'GAGK
60 DATA 60,80,85,100'BMKE
70 FOR T=0 TO 2:READ TU$(0,T)
   :NEXT'FNPI
80 DATA "HICKORY=300[SPACE2]
   WHITE OAK=285[SPACE2]",
   "HARD MAPLE/BEECH=270[SPACE2]
   ASH/BIRCH=255","ELM=215[SPACE2]
   CEDAR=205[SPACE2]WHITE
   PINE=155"'BCTD
90 FOR FU=1 TO 3:TU$(FU,0)="[SHFT N]
   O INPUT NEEDED.":TU$(FU,1)="
   [SHFT T]HERMS FOR THIS FUEL ARE
   CONSTANT.":TU$(FU,2)="":NEXT'HKXH
100 FOR T=0 TO 2:READ DD$(T):NEXT'FLPA
110 DATA "[SHFT M]NPLIS=7500[SPACE2,
    SHFT C]HICAGO=6500[SPACE2,SHFT I]
    NDY=5500", "[SHFT S]T[SHFT L]
    OUS=4500[SPACE2,SHFT O]KL [SHFT C]
    TY=3500[SPACE2,SHFT D]LLS=2500",
     "[SHFT P]ORTLD=5000[SPACE2,
    SHFT N]EW[SHFT Y]ORK=5000[SPACE2,
    SHFT B]OSN=6000"'BCIE
120 E$=CHR$(27):XP=0:YP=0'EOLD
130 K$="[RIGHT,LEFT,DOWN,UP]
    NL"+CHR$(13)'DGOD
140 KY$="0123456789.[CLEAR]
    "+CHR$(13)'DHVF
150 SP$="[SPACE40]"'BDUG
160 FOR T=1 TO 3:READ VA(T,2)
    :NEXT'FMPG
170 DATA 1.4,1,.033'BKXE
180 SC(0)=10:SC(1)=2:SC(2)=7
    :SC(3)=8'EDRL
```

Continued on pg. 86

```
190 BLOAD"FUEL SPRITES"'BBSI
200 COLOR 0,1:COLOR 4,7'CHSY
210 SPRITE 1,1,10:SPRITE 2,1,2
    :SPRITE 3,1,7:SPRITE 4,1,8
    :SPRITE 8,1,5,1,1,1'FQDI
220 MOVSPR 1,53,55:MOVSPR 2,133,55
    :MOVSPR 3,213,55:MOVSPR 4,293,55
    :MOVSPR 8,40,52'FWQL
230 DI(0)=180:DI(1)=235:DI(2)=251
    :DI(3)=257:SL(0)=160:SL(1)=250
    :SL(2)=350:SL(3)=400:SP(0)=6
    :SP(1)=7:SP(2)=9:SP(3)=11'MAAD
240 PRINT CHR$(14)CHR$(11)E$"M[HOME2,
    CLEAR]";'DLJF
250 PRINT"[DOWN4,RVS,CYAN]";
    :GOSUB 930'CFTE
260 PRINT"[RVS,UP,SPACE10,SHFT A]
    NNUAL [SHFT H]EATING [SHFT C]OSTS
    [SPACE10]"'BARM
270 PRINT"[DOWN,GRAY3,SPACE13,SHFT U]
    NIT[SPACE5,SHFT T]HERMS[SPACE5,
    SHFT C]OST/[SPACE2]"'BALN
280 PRINT"[SPACE13,SHFT C]OST[SPACE5]
    / UNIT[SPACE5,SHFT T]HERM[DOWN]
    "'BAXM
290 GOSUB 930'BDPG
300 PRINT"[RVS,UP,SPACE11,SHFT U]NIT
    [SHFT H]EATING [SHFT C]OSTS
    [SPACE11]"'BACH
310 PRINT"[GRAY3,DOWN,SPACE2,SHFT H]
    EATER[SPACE4,SHFT H]OUSE[SPACE6,
    SHFT A]REA[SPACE5,SHFT D]EGREE
    [SPACE2]"'BANJ
320 PRINT"[GRAY3,SPACE3,SHFT E]FF.
    [SPACE6,SHFT E]FF.[SPACE5,SHFT H]
    EATED[SPACE5,SHFT D]AYS[DOWN]
    "'BAUJ
330 GOSUB 930:FOR T=1 TO 4
    :PRINT"[RVS,BLUE]"SP$:NEXT'GMVG
340 FU=0'BDYC
350 DO:GET KEY A$:A=INSTR(K$,A$)'FMRI
360 ON A GOSUB 400,420,440,460,950,
    950,490'CDFJ
370 MOVSPR 8,XP*80+40,YP*56+52'FQVL
380 LOOP'BAKF
400 XP=XP+1:IF XP>3 THEN XP=0'GMTF
410 RETURN'BAQY
420 XP=XP-1:IF XP<0 THEN XP=3'GMWH
430 RETURN'BAQB
440 YP=YP+1:IF YP>2 THEN YP=0'GMWJ
450 RETURN'BAQD
460 YP=YP-1:IF YP<0 THEN YP=2'GMAL
470 RETURN'BAQF
490 ON YP+1 GOSUB 520,660,770'DOCL
500 RETURN'BAQY
520 FU=XP:SPRITE 6,0:SPRSAV XP+1,
    6'EQXH
530 MOVSPR 6,RSPPOS(XP+1,0),
    RSPPOS(XP+1,1):SPRITE 6,1,
    SC(XP)'GHMN
540 SPRITE 8,0:MOVSPR 6,DI(XP)#SP(XP)
    :FOR T=1 TO SL(XP):NEXT
    :MOVSPR 6,0#0:MOVSPR 6,53,110
    :SPRITE 8,1'JDLV
550 IF XP=2 THEN M$(1)="[SHFT P]RESS
    [SHFT N] FOR NATURAL, [SHFT L]
     FOR [SHFT L,SHFT P] GAS"
    :GOSUB 1080'FNCV
560 PRINT"[CYAN]";:CHAR 1,2,12,
    FM$(XP),1'CSDK
570 FOR T=0 TO 3:PRINT"[CYAN]";'EFJK
580 IF VB(T,0)=0 OR VB(T,
    1)=0 OR VA(FU,1)=0 THEN 610'HDAR
590 AC(T)=TH*VB(T,3)/(VB(T,
    0)/100)*VB(T,2)*3/(VB(T,
    1)/10)*VA(T,3)'JCQA
600 VA(FU,0)=AC(T)/VA(FU,1)'CVUG
610 CHAR 1,T*10,5,"":PRINT USING "
    [RVS]$[RVOFF]####.##";AC(T)'EPUJ
620 CHAR 1,T*10+1,12,""
    :PRINT USING F$(1,T);VA(FU,T)'FCVL
630 CHAR 1,T*10+1,19,""
    :PRINT USING F$(2,T);VB(FU,T)'FCFM
640 NEXT:RETURN'CBXF
660 ON XP+1 GOSUB 1070,690,700,
    1070'DUJL
670 GOTO 570'BDLI
690 M$(1)="[SHFT U]SE DECIMAL POINT
    IF APPLICABLE":GOSUB 1080
    :GOTO 720'DOJW
700 FOR T=0 TO 2:M$(T)=TU$(FU,T)
    :NEXT'FTGI
710 GOSUB 1080:IF FU>0 THEN 740'ELQG
720 GOSUB 980'BDUE
730 VA(FU,XP)=VAL(N$)'CNTI
740 IF VA(FU,2)>0 THEN VA(FU,
    3)=(VA(FU,1)/VA(FU,2))'FKUQ
750 RETURN'BAQG
770 ON XP+1 GOSUB 790,810,840,860'DSBN
780 GOTO 570'BDLK
790 M$(1)="[SHFT T]YPE AS A WHOLE
    NUMBER -- NO DECIMAL."'BFYV
800 GOSUB 870:GOTO 740'CHME
810 M$(0)="[SHFT T]IGHT HOUSE,
    [SHFT R]-26+ INSULATION=100%"'BFSO
820 M$(1)="[SHFT D]RAFTY HOUSE,
     NO INSULATION=30%"'BFFO
830 GOTO 870'BDOG
840 M$(1)="[SHFT T]YPE APPR. SQUARE
    FOOTAGE."'BFQP
850 GOTO 870'BDOI
860 FOR T=0 TO 2:M$(T)=DD$(T)
    :NEXT'FQFO
870 GOSUB 1080:GOSUB 980'CIOL
880 IF XP>0 THEN FOR T=0 TO 3
    :VB(T,XP)=VAL(N$):NEXT
    :ELSE VB(FU,0)=VAL(N$)'MIDA
890 RETURN'BAQL
```

Continued on pg. 90

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Lightpen 170C	75
Lightpen 184C	49
FlexiFont	24
Gallerias - each	21
Holiday/Clip Art I/Clip Art II/ Borders/Animals/Futuristic/	
Graphics Integrator 2 (Inkwell)	25
Graphic Label Wizard (Kra Jax)	19
Graphics Transformer (CDA)	25
Home Designer 128 (Kendall)	45
Icon Factory (Solo Unlmtd)	29
Moving Pictures (CDA)	20
Perspectives II (Kira)	39
Picasso's Revenge (Progress)	49
Photo Finish (Sol Unlmtd)	25
Printmaster Plus (Unison)	25
Art Gallery I or II	17
SCREEN F/X (Solo Unlmtd)	29

AIDS/UTILITIES

Antibump Boards (CDA)	39
1541/1571 Dr Align (Free Sp)	20
Assembler/Monitor (Abacus)	29
Basic 8 (Putech)	30
BASIC Compiler 128 (Abacus)	45
BASIC Compiler 64 (Abacus)	29
BBS Construction Set (Kira)	43
Big Blue Reader (Sogwap)	25
Big Blue Reader CP/M	32
Bobsterm Pro 64 (Progress)	39
Bobsterm Pro 128 (Progress)	49
COBOL 64 (Abacus)	29
Communicator 64 (FR SPRT)	20
Gnome Kit 64/128 (Kira)	29
Gnome Speed 128 (Kira)	39
Hot Shot Interface (Omnit)	49
How To Get Most GEOS Book	13
Kyan Pascal 64 or 128	52
Merlin 64 (Roger Wagner)	39
Merlin 128 (Roger Wagner)	49
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Super 81 Utilities (Free Sp)	29
SYSRES Enhanced (Comp Mart)	32
Troubleshoot & Repair C64 Book	16
Turbo Load & Save Cart (Spinn)	19
CPM Kit 128 (Inca)	25
TSOS Super Assembler	39

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AmigaBASIC Tutorial

Speech Tutorial

A short program demonstrates difficult areas of AmigaBASIC, offering both tips on confusing areas and tricks to make your life easier. Rather than an article followed by a program, we have combined them for the sake of clarity.

```
Speech Tutorial
 ' In the last installment, we covered the various commands and
 'functions that allow us to access Sound from AmigaBASIC.
 'This time out, let's take a look at the what's involved
 'with invoking the "voice in the machine."

 'To use speech from AmigaBASIC, we have two items available.
 'The first is a command, SAY, and the second is a function,
 'TRANSLATE$.  To use the command SAY, you must prepare your
 'text by translating it into a series of phonemes.  A "phoneme"
 'is a specialized phonetic spelling of the actual words that
 'you wish to have spoken.  I won't attempt to cover the
 'entire list of phonemes available, but will direct you to
 'Appendix H of the AmigaBASIC manual.  It is the method used
 'to put these phonemes together that we will look at.
 'First, Let's get our window set up.  As before, the odd
 'looking REM statements are for AC/BASIC users.
SetUp:
 WINDOW 2,"PHONEME Window",(Ø,9Ø)-(631,186),Ø,-1
 WINDOW 1,"Text Window",(Ø,Ø)-(631,75),Ø,-1
 MENU 1,Ø,1,"Exit"
 MENU 1,1,1,"Exit to BASIC"
 REM $IGNORE ON
 MENU 2,Ø,1,"" : MENU 3,Ø,1,"" : MENU 4,Ø,1,""
 REM $IGNORE OFF
 SAY " " ' Get the Translator library loaded
 ON ERROR GOTO HandleIt
Intro:
 A$ = "This is the default mode for speech in amiga basic."
 PRINT A$
 WINDOW OUTPUT 2
 COLOR 3 : PRINT TRANSLATE$(A$)
 WINDOW OUTPUT 1
 SAY TRANSLATE$(A$)
 'In this opening, we see just how simply we can use SAY and
 'TRANSLATE$ to get speech out of our Amiga from AmigaBASIC.
 'We can see the text of our sentence printed in the TEXT
 'window and the phoneme version printed in the PHONEME
 'window.  This also shows the translation that TRANSLATE$
 'makes on any text that we convert using it.  Let's take a
 'look at what would happen if we didn't perform the
 'translation on that same sentence.  The program will trap
 'the error and tell you that something is wrong.  Just click
 'the Mouse Button and things will continue.
ProblemExample:
 CleanScreen
 WINDOW OUTPUT 1
 PRINT A$
 WINDOW OUTPUT 2
 COLOR 3 : PRINT A$
 DELAY 2
 SAY A$
 'Since we didn't translate A$ to a phoneme, SAY didn't know
 'how to handle it.  Another problem crops up if you have
 'translated your text into phonemes, but pass it to SAY as
 'anything but all upper case.  If we were to take the word
 '"book", translate it into a phoneme, but pass it as lower
 'case, SAY would give an error condition once again.  Book
 'translates to "BUHK," but wouldn't work if passed as "buhk"
 'or any other upper/lower combination.  Therefore, if you are
 'going to pass phonemes that you have translated yourself, be
 'sure that they are all in upper case first.
Fixed:
 'Now that we know what simple things to watch for while using
 'SAY, let's take a look at the factors that control the way
 'our voice sounds and which speaker it comes out of.
 'We have the ability to control a total of nine factors that
 'define the manner in which speech is produced from
 'AmigaBASIC.  These are as follows:
   'ITEM              DEFAULT  CHOICES
   '----------------  -------  -------------------------
   'Base Pitch          11Ø    65 to 32Ø (Hz)
   'Inflection Choice   Ø      Ø (natural) or 1 (robotic)
   'Speaking Rate       15Ø    4Ø to 4ØØ (words per minute)
   'Voice Gender        Ø      Ø (male) or 1 (female)
   'Sampling Frequency  22K    5K to 28K (Hz)
   'Volume              64     Ø (quiet) to 64 (loud)
   'Audio Channel       1Ø     Ø to 11 (See below)
   'Synch or Asynch     Ø      Ø (synch) or 1 (asynch)
   'Asynch Options      N/A    Ø, 1 or 2 (See below)
 'The method used to assign these values is to set up an array
 'made up of the nine elements (Ø to 8) and then place it
 'directly following the SAY call.  For example:
   'SAY TRANSLATE$("Hi There"),Elements%
 'If we had set up Elements% correctly, we would have changed
 'the manner in which speech was produced.
      'Of the elements listed above, Sampling Frequency, Audio
 'Channel and Synchronous/Asynchronous and options should be
      'Sampling Frequency could be considered like video
 'resolution.  The higher the frequency, the better the
 'quality of the sound produced.  The one drawback, however,
 'is that the higher the frequency, the more memory required
 'to produce the sound.  Therefore, the biggest tradeoff will
 'be between memory constraints and speech quality required.
 'The default value of 22ØØØ is a very safe place to work.  We
 'will take a look at the differences that changing this value
 'will make.
    'Audio Channel decides which of the four Amiga voice channels
 'the speech should be produced on.  The table below lists the
 'available options.
    'Ø  = Channel Ø
    '1  = Channel 1
    '2  = Channel 2
    '3  = Channel 3
    '4  = Channels Ø & 1
    '5  = Channels Ø & 2
    '6  = Channels 1 & 3
    '7  = Channels 2 & 3
    '8  = Any available LEFT channel
    '9  = Any available RIGHT channel
    '1Ø = Any pair that uses 1 LEFT and 1 RIGHT
    '11 = Any available SINGLE channel
 'The default (1Ø) selects any available pair (1 left, 1
 'right) and sends the speech out that way.  If you are working
 'from a mono setup, this will be acceptable.  If you have a
 'stereo setup, the results can become unpredictable and
 'somewhat uncomfortable to listen to.  Therefore, if you plan
 'on supporting stereo setups, please take the time to set up
 'an array that selects a specific channel, or set of
 'channels, for your output.
   'The Synchronous/Asynchronous elements decide just how your
 'program acts while speech is being produced.  If you wish
 'for your program to wait until each SAY statement is
 'executed before continuing, then you would select
 'Synchronous mode (the default) for the eighth element of
 'the array.  If this is the case, then the ninth element is
 'ignored, even though you must include something in this
 'position of the array.  If you wish to allow your program to
 'proceed with its operation while SAY handles speech on its
 'own, then you would select Asynchronous for this element.
 'Once Asynch has been chosen, you must decide just how
 'additional SAY statements should be handled.  If you
 'couldn't control this, any additional SAY statements would
 'clash with the existing SAY statement as the system tried to
 'SAY all of them at the same time.  The way around this is
 'with the ninth element of the array.  The choices here are:
   'Ø  If BASIC finds a second SAY statement before the
      'current one is finished, it will hold the new statement
      'until the current one finishes.
   '1  If BASIC finds a second SAY statement before the
      'current one is finished, it will stop the current
      'statement and discontinues speech until another SAY
      'statement is encountered.
   '2  If BASIC finds a second SAY statement before the
      'current one is finished, it will cut off the current
      'statement and begin the new statement immediately.
 'Let's take a look at some of the variations on these factors
 'and listen to the results.
      'Let's set up arrays for easier use in creating character
 'voices for these demonstrations.

FOR Count = Ø TO 8
  READ FemRob%(Count)
NEXT Count
FOR Count = Ø TO 8
  READ MaleRob%(Count)
NEXT Count
FOR Count = Ø TO 8
  READ FemNat%(Count)
NEXT Count
FOR Count = Ø TO 8
  READ MaleNat%(Count)
NEXT Count
FOR Count = Ø TO 8
  READ Humorous%(Count)
NEXT Count

DATA 19Ø,1,15Ø,1,22ØØØ,64,5,Ø,Ø
DATA 12Ø,1,15Ø,Ø,22ØØØ,64,5,Ø,Ø
DATA 19Ø,Ø,15Ø,1,22ØØØ,64,5,Ø,Ø
DATA 12Ø,Ø,15Ø,Ø,22ØØØ,64,5,Ø,Ø
DATA 22Ø,Ø,13Ø,Ø,16ØØØ,64,5,Ø,Ø

 'Now let's take care of some text strings for future use in
 'the same manner.
FOR Count = Ø TO 7
 READ T$(Count)
NEXT Count

DATA "I am now a female ro bot. boring, huh"
DATA "This is a male ro bot.  Not much better."
DATA "As a pseudo-natural female, things are a little better."
DATA "This is the guy that you met in the beginning."
DATA "We can get very ridiculous if we want to."
DATA "Using this voice, I can tell humorous stories,"
DATA "or become a creature of ridicule in a fantasy tale."
DATA "And we are all available to you from Amiga BASIC."

CleanScreen
WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(Ø)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(Ø))
SAY TRANSLATE$(T$(Ø)),FemRob%
```

Continued on pg. 90

An open letter to the readers of Commodore Richard Olsen President: The Ennon Corporation

My purpose in writing is to ask you to join me in shaping the future of the new and most unusual field in computer technology today: Artifical Intelligence.

This incredible power and spectacular creative potential are available to you, for your computer right now. However, there is an alarming possibility that such amazing technology which you have every right to, may not be available to you other that through this offer.

This is unfortunate but somewhat understandable due to the way technology is created. You see, only the business oriented corporation can finance research. It therefore is in a position to dictate immediate research goals. These goals are increasing profits through more efficient production, While valid, they are merely creative and do absolutely nothing to foster exploration in new applications. The result: technology is never used to its fullest potential. But what's worst of all is that these competitive corporations have absolutely no desire to share technology with each other, let alone with you. So, they don't. As a result, the infinitesimal amount of technology that finally trickles down to you is:

- A. So expensive you are prohibited from procurring it
- B. Shamefully inferior to the real thing

remember..you can buy high-tech consumer goods, but never the technology that creates it.

This same situation confronts you in the new Artificial Intelligence field, but with a difference: There is no *true* Artificial Intelligence for the home computer user! The few programs claiming to be Artificial Intelligence are really simulators. The are not the real thing. Possessing a mere token of the power and versatility, simulators are clearly not worth their expensive price.

I have tried repeatedly to convince my colleagues that it is in their best interest to release genuine Artificial Intelligence to the general public. The refinement, modification and adaptation as individuals create new applications would improve Artificial Intelligence tremendously. This would benefit *everyone* in the long run.

I have met with little success. Apparently, it seems that immediate corporate profit is more important than sharing technology with the public. Therefore, the Ennon Corporation stands alone in offering superior Artificial Intelligence programming directly to the home computer enthusiast.

Announcing AN-83:
The "Thinking" Program

Believe me when I say AN-83 is the real thing. It is a true "thinking" program that receives an initial "knowledge base" from a data file read when AN-83 is started. Using inductive and deductive logical analysis, this amazing program deduces everything from that data and adds it to its memory. Conversing with you, AN-83 adds and combines with facts already known. It generates new conclusions not explicitly contained in its original knowledge base—just like your own thinking process! The result: it knows considerably more than the specific facts given to it.

AN-83 can also think about anything. It is virtually unlimited in its application. Think of your possibilities. The potential is limitless. In the right hands, AN-83 would revolutionize the adventure, strategy and other smart game-playing programs to say nothing of classic arcade games. On the other hand, AN-83 could be one of the most powerful business analysts available to the home computer.

FREE SOFTWARE

In addition, you will be receiving *free*, Eliza-the most amazing conversational A.I. program to date. Run this for your friends and jaws will drop with amazement. Eliza's responses are so human, it's uncanny. An entertaining program, Eliza will answer once and for all the question: What can *your* computer do?

How to Learn
Artifical Intelligence

You can be creative. Experiment and modify to fit your personal use because AN-83 and Eliza both possess source code in basic, the most popular easy to use language for the micro. Their extensive, easy to understand commands walk you through the source code step by step. It's suprisingly simple. Even the beginner can understand the "How and Why of A.I."

A Fantastic Savings

The real profit to Ennon Corporation will be your participation in the future of Artifical Intelligence. Therefore, I am pleased to say nobody will miss this chance because they could not afford it. AN-83 is priced to cover just a fraction of its research and developmental costs.

The "Thinking" Program AN-83 is just $23.57. What's more, the astounding Eliza is yours, absolutely **free**.

I guess it's obvious that I want you to participate in the future of Artificial Intelligence. Forgive my excitement and enthusiasm but I just know you are going to be very happy and impressed that such things could be done with your computer. You just won't believe it. Please take this opportunity now. Simply fill out your coupon below and mail today. Don't miss out. It's such a wonderful future of discovery and excitement that awaits you.

With the very best of wishes,

Richard Olsen

☐ Please send me the "Thinking" Program AN—83 for only $23.57.
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AmigaBASIC Tutorial

Continued from pg. 88

```
WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(1)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(1))
SAY TRANSLATE$(T$(1)),MaleRob%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(2)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(2))
SAY TRANSLATE$(T$(2)),FemNat%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(3)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(3))
SAY TRANSLATE$(T$(3)),MaleNat%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(4)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(4))
SAY TRANSLATE$(T$(4)),Humorous%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(5)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(5))
SAY TRANSLATE$(T$(5)),Humorous%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(6)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(6))
SAY TRANSLATE$(T$(6)),Humorous%

WINDOW OUTPUT 1 : COLOR 1 : PRINT T$(7)
WINDOW OUTPUT 2 : COLOR 3 : PRINT TRANSLATE$(T$(7))
SAY TRANSLATE$(T$(7)),FemNat%

YourTurn:

  CleanScreen
  A$ = "Now type in text that you wish for me to say.,"
  A$ = A$ + "You may change the voicing by changing the array"
  A$ = A$ + "name in the SAY state ment., hit re turn on any"
  A$ = A$ + "blank line to end."
  SAY TRANSLATE$(A$),MaleNat%

  WHILE A$ <> ""
    WINDOW OUTPUT 1 : COLOR 1
    LINE INPUT A$
    IF A$ <> "" THEN
      WINDOW OUTPUT 2 : COLOR 3
      PRINT TRANSLATE$(A$)
      SAY TRANSLATE$(A$),MaleNat%
    END IF
 WEND
 Cleanup

 'You'll notice that I have made some slight modifications to
 'the spelling of some of the words in the text strings.  This
 'is due to the fact that TRANSLATE$ can't get the phonetics
 'correct 100% of the time.  The only way to determine which
 'particular spellings cause problems is to play with them and
 'listen to them after running your text through the
 'translator.  If it doesn't sound correct, try subtle
 'spelling changes.  Above, by simply separating the syllables
 'of ROBOT made the difference between hearing the word
 'pronounced as RO BOT instead of RAH BOT.  Another example of
 'this was in the word STATEMENT.  By simply separating the
 'syllables, translator recognized the long A and made a
 'proper phoneme mixture.
      'If you are interested in learning how to create a phoneme
 'string without the use of the translator, I will direct you
 'to Appedix H in the AmigaBASIC manual and the chapter 6,
 '"Speech Synthesis," in the book, Advanced Amiga Basic,
 'from Compute! Books.  The authors have done a fantastic job
 'of describing the process in which phonemes are created and
 'give a relatively complete listing of the various sound
 'combinations available to you using the SAY statement in
      AmigaBASIC.
 'Until next time...taj.
HandleIt:

  SAY TRANSLATE$("I can't handle those if they are phonemes.")
  PRINT "See what I mean?  Click the Mouse."
  WHILE MOUSE(0) = 0 : WEND
  GOTO Fixed

SUB CleanScreen STATIC

  WINDOW OUTPUT 1 : CLS
  WINDOW OUTPUT 2 : CLS
  COLOR 1

END SUB

SUB DELAY(Count%) STATIC

  current = TIMER
  WHILE TIMER < current + Count% : WEND

END SUB

SUB Cleanup STATIC

  SAY TRANSLATE$("So long.")
  REM $IGNORE ON
  WINDOW 1,"BASIC",(0,0)-(617,186),31,-1
  WINDOW CLOSE 2
  MENU RESET
  REM $IGNORE OFF
  END

 END SUB
```

END

Game Programs/Castrovia

Continued from pg. 80

```
880 PRINT" ",N1$,N2$'BIMM
885 PRINT"TROOPS",R(1),R(2)'BKJT
890 PRINT"[DOWN]BARBLES",BA(1),
    BA(2)'BMPQ
895 FOR X=1 TO 5000:NEXT X:END'FJRU
900 REM SOUND'BFYF
905 FOR XX=1 TO 5:POKE SS+24,15'FMGO
910 POKE SS+5,9'CFDG
915 POKE SS+1,20'CGPL
920 POKE SS+4,128'CHAH
925 FOR DD=1 TO 10: NEXT DD'EICO
930 POKE SS+4,129'CHBI
935 FOR DD=1 TO(50*INT(10*RND(1)+1))
    :NEXT DD,XX'JVKV
940 FOR XX=SS TO SS+24:POKE XX,O
    :NEXT XX'GQYP
945 POKE SS+24,7'CGAO
950 POKE SS+5,12*16+0'EJBM
955 POKE SS+6,15*16+10'EKER
960 FOR XX= 255 TO 100 STEP -1.4'FLEO
965 POKE SS+1,XX'CGSQ
970 POKE SS+4,17'CGYM
975 NEXT XX'BCYQ
980 POKE SS+24,15'CHWN
985 POKE SS+1,15'CGTS
990 POKE SS+4,128'CHAO
995 FOR XX=1 TO 900:NEXT XX
    :FOR XX=SS TO SS+24:POKE XX,0
    :NEXT XX:RETURN'LCJF
1000 PRINT"YOU CAN'T PUT REGULAR
     TROOPS IN ":RETURN'CBOD
```

END

128 Users Only/128 Mode

Continued from pg. 86

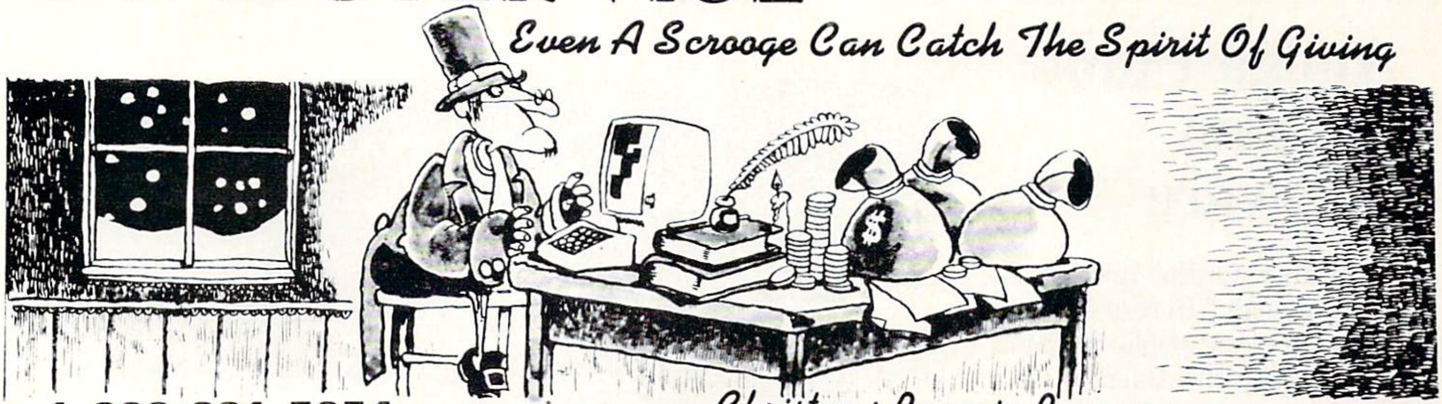
```
910 END'BACE
930 FOR T=1 TO 3:PRINT"[CYAN,RVS]"SP$
    :NEXT:RETURN'GJTM
950 IF FU<>2 THEN RETURN'FDPL
960 FM$(2)=NA$(A):VA(2,2)=NA(A)'CAGP
970 GOTO 490'BDML
980 N$=""'BCKM
990 WINDOW XP*10+2,YP*7+5,XP*10+7,
    YP*7+5,1'JYUX
1000 DO:GET KEY A$:IF INSTR(KY$,
     A$)=0 THEN 980'HQTB
1010 IF A$=CHR$(13)THEN EXIT'FGCX
1020 N$=N$+A$'CGOW
1030 IF LEN(N$)>6 OR A$="[CLEAR]
     "THEN N$="":PRINT"[CLEAR]"
     :GOTO 1050'JPOG
1040 PRINT"[CYAN]"TAB(6-LEN(N$))
     N$'EIVB
1050 LOOP'BAKX
1060 PRINT"[HOME2]":RETURN'CBJA
1070 M$(1)="[SHFT N]O INPUT
     REQUIRED."'BFXH
1080 WINDOW 1,22,38,24,1'BNTE
1090 FOR T=0 TO 3'DDQE
1100 TB=(38-LEN(M$(T)))/2'EOIY
1110 PRINT"[GRAY3]"TAB(TB)M$(T)'CIWX
1120 M$(T)="":NEXT'CGGX
1130 PRINT"[HOME2]":RETURN'CBJX
```

END

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by Graham Kinsey

Amiga Public Domain Software

What's new for the Amiga in the public domain? Here are some of the more recent public domain programs for the Amiga.



For the first time since I have been writing this column, no new Fish disks have been released. However, I do have a number of programs from PeopleLink and from local bulletin boards to talk about, so all is not lost. The best public domain programs this month are CommandReg, a program which adds a whole new dimension to AmigaDOS batch files, and PacMan87, an excellent shareware arcade game. For each program, the author is given, and if that PD program is available on the Fish or AMICUS of public domain disks, the number is given before the description. I do not keep track of which programs are available on PeopleLink here since virtually all of the programs mentioned in this column are available for downloading in the libraries in the Amiga Zone on PeopleLink (if not by the time I write this, then certainly by the time this column is published). When a public domain program has been classified as shareware, this is also mentioned, with the suggested amount.

Cancel: by Bryce Nesbitt

If you are tired of having to answer system requesters, here is a program that can answer them automatically for you. When you run Cancel, the next time a system requester comes up, Cancel will automatically select the Cancel gadget for you. Since most requesters ask you to insert a disk (that you don't want to use anymore), or something else trivial, many people like to kill those requesters immediately. This program would be useful to those who are running GOMF (reviewed in the November 87 installment of this column), since this program will always take care of the "Task Held" requester and bring you immediately to the GOMF window.

Finish: by Mark Wolfskehl

Multitasking usually makes things a lot easier on the Amiga. But when two simultaneously running programs want to access the same storage drive, multitasking only makes things worse. On the Amiga if two programs both want to access the same drive, they will each be allotted a short amount of time for drive access, before they are forced by Exec to give up access to that storage device to the other task which is waiting its turn.

The reason why this is so bad is because if each program is trying to access data that lies on a separate track, the drive head will be constantly switching between tracks every time one task gives up access of the drive. Not only does this slow things down, but you will also experience that hideous "gronking" noise when the drive head is constantly moving. Finish can eliminate these problems. Finish will force a task that has just decided to request access to a drive already being used to wait until the task that is using the drive is completely finished. The only bad point about Finish is that it must be executed each time you want to use its feature. Therefore, you are forced to load Finish into memory in order to gain any real benefit. At least you don't have to allow tasks to fight over access to a drive (and cause undue wear on your drive).

Mousetalker: by Rod Molina

This program is designed as an aid for Journal (reviewed in the December '87 installment of this column). Mousetalker will speak whenever a keyboard input mouse movement or mouse button input has been performed during the playback of a Journal file, so that you can more clearly understand what is happening during the playback of any Amiga session that has been recorded with Journal.

NoKLICKstart: by Bryce Nesbitt

The Amiga floppy drives can be *very* annoying! If you've ever experienced the torturous noise caused by not having a disk in an Amiga floppy drive, I'm sure you'll agree. NoKLICKstart will eliminate this dreadful noise. The big catch is that this program changes a bit in the Kickstart code. Therefore, those who have Kickstart in ROM are out of luck.

Autotest: by Michael Hitch

Autotest will test the performance of your hard (or floppy) drive. It will perform both sequential reads and random reads for testing purposes. Also included is a program called DiskVerify, which will verify every cylinder on a floppy or hard disk to ensure that there are no errors.

CommandReq: by Jay Johnson and Sam Morse

CommandReq is an extremely handy program for writing batch files and

Continued on pg. 94

Continued from pg. 92

startup-sequences. CommandReq allows you to create yes/no questions concerning whether a certain command should be executed or not. CommandReq is unique in that it will bring up a standard system requester, asking you if you want that particular command executed or not. There will be three options available as gadgets: Yes (executes the command), No (skips the command and continues on with the batch file), and Stop (halts execution of the batch file). The command in question will be displayed inside a string gadget, which can be edited if you want to alter the command, or even change it entirely! When writing the batch file, you can specify a timeout, which when the amount of time specified for the timeout has expired, will automatically select one of the three gadgets. Of course, you choose which option will be selected by default. Not only does this offer a lot of power and flexibility when creating batch files, it also makes a batch file much more user-friendly.

Dbuglin: by Steve Raineri
For C programmers (or for any programmer who uses a language that doesn't have line numbers), who find it a pain to have to count lines while debugging, Dbuglin will add line numbers to every tenth line. It adds them as comments. Dbuglin can revise source code that already has been numbered, and has had lines added or deleted.

Gauge: by Peter de Silva
If you like the fuel gauges in Workbench that display how full a disk is, but don't like Workbench in general, here's a program you might want to try. Gauge displays memory usage, with a Workbench-type fuel gauge. Gauge can be moved and resized at any time.

Microhost: by Michael Cox
(Shareware: amount not specified)
Microhost is a miniature bulletin board system. It allows people to call you via modem, and have your computer answer automatically just like a real bulletin board. Microhost features include two-way message support, Xmodem uploads and downloads, chat, password protection, bulletins and more, from the Sysop's end Microhost can also double as a simple terminal program.

Scrub: author unknown
If you think that disk heads should be cleaned, here's a program that will make the drives spin so you can clean the heads.

TTT: by Ron Carlton
Here's a 3D Tic-Tac-Toe game that uses the computer for one of the players. You can decide if you want to go first or last.

HDbackup: by Charles Carter
If you are unfortunate enough as to not receive a backup program with your hard drive, here's a very simple program that will fill in the gap. HDbackup does nothing other than backing up a hard drive or restoring a backup hard drive. Be sure to format lots of floppies before you start the backup.

Access: by Keith Young
Access is another terminal program based on version 1.34 of the Communicator, the very popular terminal program by Dan James. The biggest new feature in Access is that it supports 16 different colors (including colored backgrounds).

The Silver Demo: by Impulse Inc.
A very nicely done animation demo which shows off what can be created with Silver, a Hold and Modify frame animation package from Impulse (makers of Prism, a HAM painting program). Silver basically allows you to create Juggler-type demos.

Esuom: by Sean Riddle
Another graphics display hack, you might have noticed that "esuom" is "mouse" spelled backwards. That's all that needs to be said about this program!

FastDOS: by Martin Taillefer
A simple 20-line program that speeds up AmigaDOS. FastDOS will speed up AmigaDOS by a small amount, .75 percent (that's .75 percent, not 75 percent!). The source code is provided (C programmers take note; this code is written in Modula-2, but porting it shouldn't be a problem).

Kickbench version 1.2: by Alonzo Gariepy
This program is an update to the original version of Kickbench (reviewed in the August 87 installment of this column). Kickbench will now work correctly with version 1.2 (release) Kickstart and Workbench disks.

Sectorama: by David Joiner
Sectorama is a disk editor, that displays a wealth of information due to its high-res screen. You must select the drive that you want to use when you load Sectorama. Sectorama has the potential to be able to edit a simulated storage device that is created out of a RAM disk.

Demolition: by Kriton Kyrimis
If you ever wondered what it would be like to play a game of Breakout on your Workbench screen, with the window, icons and drawers on the screen acting as the "bricks," here's a good demo of such an event.

You don't have to spend forty dollars in order to entertain yourself on your Amgia. Not only are there many programmers out there who are writing original, challenging public domain and shareware games for your Amiga, but there are also others working night and day to port over popular board games and games from other computing environments. Even if you don't like a certain public domain game, at least you haven't parted with a wad of cash.

Hack: by John Toebes (Fish 7,8,25,62)
This game is a port over from the Unix world. Hack is another D&D type game, where the ultimate goal is to retrieve the Amulet of Yendor. This Amulet is located deep inside a multi-level dungeon. You can choose one of six different character classes for your alter ego: Cave-Man, Fighter, Knight, Wizard, Speliologist, and Tourist. Hack in its original form (and in version 1.0.1A on the Amiga) relies solely on complexity and richness for its entertainment, for there are no graphics, only ASCII characters for representation of the monsters, treasures, and all the other objects in Hack. This lack of graphics for the Amiga version of Hack was rectified with version 1.0.1E of Hack for the Amiga. The ASCII characters were replaced with 8 color graphic characters.

There have been many more enhancements in the latest version, 1.0.3D. There is a new set of graphics characters which look much better than the set in 1.0.1E. Whenever you die, a "death scene" is loaded up. This death scene in a nice IFF picture, and the program will even personalize the picture for you, saying who you were and how you died. There is also a new parameter file, which allows you to decide such things as whether you want to use the space bar for pausing, whether you want the inventory sorted by item type and whether your character is male or female.

As for the game itself, let me say that it can be quite addictive! The big challenge

Continued on pg. 96


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Continued from pg. 94

when playing Hack is often not whether you can keep all the nasty monsters from killing you, but will you be able to find enough food so that you don't starve to death! Only two of the six classes are allowed to bring any food with them, and both the Tourist and Speliologist classes are quite weak and barely able to stay alive in this vicious world for long. Note that there is a special "Wizard" mode, which allows you to get used to the game and its idiosyncrasies (by basically making you invulnerable), but your score won't get saved whenever you are playing in Wizard mode.

Conquest: by Rob Shimbo (Fish 10,24)
This game is ported over from Unix. The object of this interstellar conquest game is to colonize as many planets as possible and to build the population of your empire as high as you can. You play against the computer only; there is no provision for more than one person to play. Since this game is a straight port from the Unix world, the graphics are of the crude ASCII type. However, there is a decent amount of complexity and strategy involved, so if you don't care about graphics, then this game might please you.

Pacman87: by Steve Jacobs and Jim Boyd (Shareware: $10)
Here is one of the best public domain games to appear in a while. This is not just a cheap copy of the original game. PacMan87 has five different screens all interconnected via tunnels and staircases. If you're stuck on a particular screen, just move on to the next screen. There are also many traps laid throughout the screens, including fire pits, flame throwers and electric arcs. PacMan87 keeps a top ten score list and has difficulty levels, digitized sounds, and a pause button. If you're looking for a good arcade game, check out PacMan87.

Yachtc: by Sheldon Leemon (Fish 10; Amicus 2)
The popular dice game, up to four people can play at once.

Backgammon: by David Addison (Fish 28)
A simple implementation of the game Backgammon. The doubling cube is not used in this game, and no score is kept. You cannot play against another person.

Cribbage: by David Addison (Fish 28)
Another computer version of an old board game.

Milestone: by David Addison (Fish 28)
Computer version of the French card game Milbourne. You cannot play against another person. The sound effects do add a bit to the enjoyment. The computer has one flaw in its strategy which will give experienced Milbourne players enough of an edge to win the majority of the time. Score can be kept after each game if you like, the grand total goal being 5000 miles. This one can be slightly addictive.

Othello: by David Addison (Fish 28)
In this version of Othello, the board is tilted, giving a quasi-3D look to the game. You select the position you want to place your piece by clicking with the mouse on one of four arrows that move a pointer. You can not play against another person.

Canfield and Klondike Solitaire: by David Addison (Fish 32)
Both of these solitaire games use a 640 by 200 graphics mode, which allows a good display of the cards. The sound effect of picking up/putting down a card is somewhat realistic. I found the Klondike version to be the more entertaining of the two.

Puzzle: by Bill Beogelein (Fish 32; Shareware: amount not specified)
A simple little puzzle program. Fifteen square pieces in a four by four box, with only one space vacant at a time. The object being to get the numbered square in numerical order.

Triclops: By Geodesic Publications (Fish 35)
This game is a public domain version of a game put out by Geodesic Publications, released for promotional purposes. The public domain version is a complete game in itself. The object to protect your city from being destroyed by five Triclops walkers (which look similar to the AT-AT walkers in Star Wars). You have three jet fighters and two self-detonating mobile tanks with which to accomplish your task. Control of the fighter is done completely via the mouse. Not only can you move in all three dimensions, but you can also rotate the jet along any of the three axis. You can even fly into space, in order to destroy the mother ship space hull. The graphics are very nice indeed, especially the earth, which is drawn via geodesic fractals. This allows several levels of detail to be available for representing portions of the earth. Everything is drawn in a true 3D perspective. You can even record your playing session, and then have it played back later. The only complaint, if any, is that the game really isn't played in real-time; it takes a little while to draw the land each time to change views, but that may be nit-picking a bit too much. You can choose whether the graphics screen uses four or five bit-planes.

TunnelVision: by David Addison (Fish 36)
This is a maze game. But the perspective is a true 3D one, from within the maze. And there are complications, that turn this simple maze game into a real challenge. First of all, your vehicle can leave a trail as you wander through the maze, and if you track back over that trail, your vehicle's battery will start to drain. If your battery becomes completely drained, your short-range view will deteriorate, making it very difficult to see. And if you should happen to bump into a wall, your vehicle will sustain damage. If you sustain too much damage, your long-range view will malfunction. The long-range scanner shows where you have traveled. You can view the maze, but you can only do so three times.

Reversi: by Manuel Almudevar (Fish 38)
This version of Othello has several options. First of all, there are five difficulty levels. Second, you can ask the computer to show you all possible moves. The computer can also suggest a move to you. You can decide whether you want the computer to speak to you. This program runs at a low priority, so that if you are playing with a high difficulty level, you can easily run and use other programs while the computer is thinking about its next move.

Cosmoriods: by John Harris (Fish 40; AMICUS 15; Shareware: $6)
Asteroids for the Amiga. This program uses the keyboard for controls. The rocks have some color to them, but otherwise this game will wear thin on most people rather quickly.

Missile Defense: by Glen Merriman (Fish 50; AMICUS 16; Shareware: $5)
This game is of course a copy of *Missile Command*. Let me say first that because this program was written entirely in assembly language (a rarity among Amiga programs), it is *fast*! For once, multitasking may be necessary in order to slow the missiles down enough for most mortals to have a fighting chance. The sounds in this game are outstanding, especially the opening "scream," since the sounds are digitized. If you like, you can replace the

supplied sounds with your own, as long as they are in IFF format. If you send in the five dollar shareware fee, not only will you receive the source to the program, but you will also receive a copy of Glen's machine language monitor/debugger.

Cos: by Steve Michel (Fish 51)

A *Wheel of Fortune* game. Up to four people can play at once. The only problem I saw with this game is that not enough of the screen is devoted to the wheel itself. There aren't even any numbers on the wheel.

Clue: by Greg Pryor (Fish 45)

The popular board game. You can't play against another person, but you can choose how many computer opponents you have. You can also decide how smart your opponents are (the perfect option!). All input is via the mouse.

3D Breakout: by Tim Kemp (Fish 50; AMICUS 15; Shareware: amount not specified)

An old favorite with a unique twist. This version of *Breakout* truly is 3D, but you will able to play the game as it is intended only if you are wearing a pair of red/blue 3D glasses. The field of play is a box, with bricks on four sides: in back, on top, and to the left and right. Your paddle floats where the bottom of the box would be, but the ball will fall out of the box if you don't intercept it with your paddle.

Larn: by Edmund Burnette (Fish 63)

Another Unix port, this game has some similarity to Hack but with a lot more to offer. Your daughter has been stricken with a deadly disease, and the only chance to save her is to find a very rare and magical potion that will cure her disease in a limited amount of time. When you start Larn, instead of being immediately in a dungeon, you end up on the surface, in the middle of a little adventuring town. In this town there is a bank, a college where you can take such courses as Applied Wizardry, Behavioral Psychology, and Contemporary Dance. There is a shop where you can buy all the equipment that you can afford, and another shop that will buy back new and used items for cash. There is even a tax office (more on that later).

While Hack characters have only a strength attribute, Larn characters have all six of the classic D&D attributes. Another major feature in Larn that is not in Hack is spell casting. Characters can actually cast spells that they have learned from reading spell books. Unlike Hack, hunger is not a factor, but time is. It is easier to feed yourself than to go back in time! Another difference between Larn and Hack is that Larn has difficulty levels. You start off at difficulty level zero, and then if and when you complete the game (which isn't overly difficult), the next time you boot up Larn, you will start the game over at difficulty level one. Not only is the game generally harder, but you don't even get a measly dagger and leather armor with which to protect yourself. If this weren't bad enough, you will now owe taxes on the valuables owned by you when you won the game at the previous difficulty level! Of course you don't inherit anything that you had from the last game. Like Hack, Larn has similar graphics characters (you can even interchange characters between Larn and Hack 1.0.3D). There is also a "wizard" option in Larn, as well as a parameter file. One last piece of advice. Even though your character doesn't have to eat, make sure that you take a break once in a while so that you can feed yourself!

Daleks: by Robert Paauwe (Shareware: $10)

This game is based on the "Doctor Who" television show. You have to try to avoid the Daleks, who are chasing you around the screen. Your main defense is to try to force the Daleks to crash into each other. If some get too close, you can use your sonic screwdriver to destroy them. The sonic screwdriver will only work once per screen. You can also teleport at any time to another area of the screen, but you could teleport on top of a Dalek. A nice feature of this program is that you can let the Amiga take control of your character, and watch her play the game.

Expect a lot of new PD programs in next month's column. As always, I can be reached in the Amiga Zone on PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617-769-8444, 8pm-8am). If you have written a PD/shareware program or have obtained one that you think is worth mentioning to all Amiga owners, then please attempt to contact me. See you next month.

Fish disks: *For a catalog, send a SASE and four loose stamps, or $1 to: Fred Fish, 1346 W. 10th Place, Tempe, AZ 85281.*
AMICUS Disks; *$7 per disk, or send $1 for a catalog to: PiM Publications, P.O. Box 869, Fall River, MA 02722.* ■

by Stephen Rodda

Custom Screen Designer

Create multi-color graphics screens for your games, add neatly organized instruction pages to your business programs, make impressive title screens or just have fun creating pictures, all with this easy-to-use, user friendly utility for the Commodore 64.

Custom Screen Designer is a screen creating utility which lets you create multi-color screens using any graphics character, number, letter, and color available on the 64. These screens may be saved on disk or tape and recalled through your own programs.

After a screen has been loaded, a simple SYS command instantly sets up the screen, the border color, and the background color in less than a second. The screen may then be cleared and recalled as many times as you wish by using the same SYS command.

When you first run Custom Screen Designer, you have an option of displaying instructions. These instructions give a general description of how to create a screen and list the functions available with the keys needed to call them. After viewing the instructions, you will see a blank screen with a flashing cursor. To create a screen, you may now press any key on the keyboard, and use any modes such as reverse or quote mode. To change the color of the cursor, use the standard CTRL key with a number key, or the COMMODORE key with a number key.

There are a number of functions that can help when creating a screen — they are as follows.

Memorize

Memorize lets you do as the name says, memorize the screen. The purpose of this function is to store a screen in memory. The monitor screen may be cleared (using the SHIFT and CLR HOME keys) without affecting the stored screen. A new screen can be worked on and at any time the old screen may be recalled using the recall function. To memorize a screen, press the F1 function key. The border color will change for a split second and return to its



LINDA CLARK

previous color. This is just to show that the screen has been memorized.

Recall

Recall will retrieve a memorized screen along with the border and background colors that were memorized with the screen. This will erase the screen being displayed at the time the recall function is executed and will not store it before doing so. If a recall function is executed, the screen being worked on should be saved to disk or tape if desired. By pressing F2, the previously memorized screen will be recalled.

Flip X

The Flip X function will flip the screen on the X-axis, a horizontal line in the middle of the screen. In effect, this turns the screen upside down. When flipping a screen with graphics characters, such as a heart (SHIFT S), the heart will be moved to its corresponding line on the opposite side of the axis, but the heart itself will not be turned upside down. This function should primarily be used with text, reversed spaces, or other symmetrical characters. Pressing F3 will flip the screen on its X-axis. To flip the screen back to its original condition, press F3 again.

Flip Y

The Flip Y function will flip the screen on its Y-axis, a vertical line in the middle of the screen. As with the Flip X function, Flip Y will only move the character; it will not turn the character itself around. This also should primarily be used with text and symmetrical characters. To flip the screen on the Y-axis, press F4.

Reverse

The reverse function will reverse any character on the screen. A reversed character is simply an eight pixel by eight pixel box with all pixels illuminated except the ones that form the character. Press F5 to reverse a screen.

Instructions

Pressing F6 will display two pages of instructions. As explained before, these instructions give a general description of how to use Custom Screen Designer, and give the names of the functions along with the keys needed to call them.

Load

The load function will load a Custom Screen Designer file from a disk or tape and display it on the screen. When loading a screen, it will not erase a memorized screen. If desired, a memorized screen may be recalled after a file has been loaded. To load a screen, press F7. A prompt asking for the filename will appear. Type the filename, no more than sixteen characters will be accepted, and press RETURN. You will then be asked if you are using a disk or tape. Press "D" followed by a RETURN if you are loading from a disk, or "T" followed by a RETURN if you are loading from a tape. Then, after answering an "OK TO CONTINUE" prompt with "Y" or "N," the file will load and the loaded screen will appear with a flashing cursor.

Save

The save function will save the screen that was displayed before calling this function. It will not save a stored screen. To save a screen, press F8. A prompt asking for the filename will appear. Type the filename, no more than 16 characters will be accepted, and press RETURN. You will then be asked if you are using disk or tape. Type "D" for disk or "T" for tape, followed by a RETURN. After answering an "OK TO CONTINUE" prompt with "Y" or "N," the screen will be saved.

When Custom Screen Designer saves a screen, it also saves a short machine language routine to recall the screen. This is located at 34770 or ($87D2), while the data for the screen and it color is located at 32768 or ($8000).

A screen saved on a disk takes nine blocks or 2K, and a screen saved on tape takes 20 tape counters to save.

Loading Screens Through BASIC Programs

Once a screen has been created and saved, it may be loaded in immediate mode or through your own programs. To load a screen in immediate mode, a simple LOAD"FILENAME",8,1 <RETURN> for disk or LOAD"FILENAME",1,1<RE-

TURN> for tape, followed by a SYS 34770 <RETURN>, will load and display the screen. A special technique, described below, must be used to load to a screen through your own programs.

After a file has been loaded through a program, the computer automatically gives control to the first line of the program in memory. When loading a file, this is a problem that should be avoided by loading the file in the beginning of the BASIC program. The following line should be used to load a file, and should be the first line of the program.

DISK

10 IF A=0 THEN A=1 : LOAD"FILENAME",8,1

TAPE

10 IF A=0 THEN A=1 : LOAD"FILENAME",1,1

After typing RUN, A will be equal to zero therefore the program will proceed and set A to one. The program then loads the file that is indicated by the LOAD command. Because a load function was executed, the computer gives control to the first line of the program, which is line 10. The statement IF A=0 is not true this time because A was set to one. The line is ignored the second time and the program continues to the next line.

Anytime after the LOAD, a SYS 34770 command may be inserted into the BASIC program. This SYS will instantly display the screen, the border color, and the background color of the file that was just loaded.

The method just described may not be used to load more than one file. To load more than one file through a program, a short subroutine is needed:

```
1000 LL=LEN(NA$)
     :FOR DD=1 TO LL
     :POKE 34849+DD,
     ASC(MID$(NA$,DD,
     1)+CHR$(0)):NEXT
1010 POKE 780,1:POKE 781,8
     :POKE 782,1:SYS 65466
1020 POKE 780,LL:POKE 781,34
     :POKE 782,136:SYS 65469
1030 POKE 780,0:SYS 65493
     :RETURN
```

This subroutine can be placed anywhere in a program and may be called by a GOSUB command at any time. Before calling it, NA$ must be set to the name of the file to be loaded. This routine will load as many files as desired provided NA$ is set to the new filename each time the routine is called. For example, to load and display three different screens (SCREEN 1, SCREEN 2, SCREEN3), one after the other following program should be used:

```
10 NA$="SCREEN 1":GOSUB 1000
   :SYS 34770
20 NA$="SCREEN 2":GOSUB 1000
   :SYS 34770
30 NA$="SCREEN 3":GOSUB 1000
   :SYS 34770
```

In line 10, NA$ is set to the filename of the first file, SCREEN 1. The next command (GOSUB 1000) causes the program to jump to the subroutine (shown above) that loads the file. The file is then loaded and the program returns to the SYS 34770 command in line 10. This SYS command will display the screen that was just loaded. Line 20 and line 30 act the same way as line 10 except NA$ is set to the new filename each time.

The load routine assumes that the disk drive is being used as the source of the file. To change it so that the tape drive may be used, the POKE 781,8 command in line 1010 must be changed to read POKE 781,1.

It should be noted that only one screen may be displayed or stored in memory at a time. However, it is possible to have a screen displayed and have a different screen stored in memory at the same time. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Custom Screen Designer

```
2 Z=6:Z1=6:PRINT CHR$(147)
  :PRINT CHR$(5):POKE 34847,6
  :POKE 34848,6'IHRM
4 GOSUB 168:POKE 650,128'CLTF
6 GOSUB 170:SYS 49152:GOSUB 104
  :PRINT CHR$(147)'FTDK
8 SYS 49574:B=PEEK(782)
  :H=PEEK(781)'FTPN
10 IF B>39 THEN B=B-40:GOTO 10'GKYC
12 IF B>40 THEN H=H-1'FGQD
14 G=H*40+1024:B=B+G:C=54272+B
   :IF PEEK(B)=32 THEN POKE C,
   PEEK(646)'NIKQ
16 D=PEEK(B):E=D:F=128:IF D>127 THEN
   F=-F'JTMN
18 E=E+F:POKE B,E:F=-F'FKKK
20 GET A$:GOSUB 32'CFYA
22 IF PEEK(214)=24 THEN GOSUB 28'FJJE
24 IF A$<>""THEN POKE B,D:PRINT A$;
   :GOTO 8'HLCI
26 GOTO 18'BCQE
28 IF A$=CHR$(13)OR A$=CHR$(17)OR
   A$=CHR$(141)THEN A$=""'LVBR
30 RETURN'BAQY
32 IF A$>CHR$(132)AND A$<CHR$(141)
   THEN GOSUB 88'IODJ
34 IF A$=CHR$(133)THEN SYS 49588
   :POKE 49646,Z:POKE 49647,Z1
   :GOSUB 62'IHIO
36 IF A$=CHR$(137)THEN SYS 49622
   :GOSUB 64'GPJL
38 IF A$=CHR$(134)THEN SYS 49261'FMGM
40 IF A$=CHR$(138)THEN SYS 49366'FMQF
42 IF A$=CHR$(135)THEN SYS 49486'FMQH
44 IF A$=CHR$(139)THEN GOSUB 122'FKGJ
46 IF A$=CHR$(136)THEN GOTO 66'FJOK
48 IF A$=CHR$(140)THEN GOSUB 78'FJQM
50 IF A$=CHR$(2)THEN Z=Z+1
   :POKE 53280,Z:IF Z>15 THEN Z=0'LWTN
52 IF A$=CHR$(22)THEN Z1=Z1+1
   :POKE 53281,Z1:IF Z1>15 THEN
   Z1=0'LDJQ
54 IF P=1 THEN P=0:D=PEEK(B)'GJCL
56 RETURN'BAQH
58 SYS 49152:POKE 53280,Z+1
   :FOR X=0 TO 99:NEXT'HUHR
59 POKE 53280,Z:POKE 34847,Z
   :POKE 34848,Z1'DYTR
60 RETURN'BAQC
62 POKE 53280,Z+1:FOR X=0 TO 100
   :NEXT X:POKE 53280,Z:RETURN'IANO
64 Z=PEEK(49646):Z1=PEEK(49647)
   :POKE 53280,Z:POKE 53281,Z1
   :RETURN'HLLS
66 GOSUB 58'BCYI
68 PRINT CHR$(147)CHR$(18)CHR$(5)CHR$
   (17)"LOAD"CHR$(146)CHR$(17)'HAQU
70 POKE 53280,6:POKE 53281,6'CPXH
```

```
72 GOSUB 90:IF OK$<>"Y"THEN GOSUB 168
   :SYS 49217:GOTO 48'ISYO
74 SYS 49537:SYS 49579:IF T$="D"THEN
   GOSUB 236'GRAO
76 SYS 34770:Z=PEEK(34847)
   :Z1=PEEK(34848):D=PEEK(B):P=0
   :GOTO 24'JKFW
78 GOSUB 58:POKE 53280,6
   :POKE 53281,6'DSAQ
80 PRINT CHR$(147)CHR$(5)
   :PRINT CHR$(18)"SAVE"CHR$(146)'GSLM
82 GOSUB 90:IF OK$<>"Y"THEN GOSUB 168
   :SYS 49217:RETURN'IQBO
84 SYS 49537:SYS 49556:IF T$="D"THEN
   GOSUB 236'GRUP
86 SYS 34770:RETURN'CGGM
88 POKE B,D:P=1:RETURN'DHAP
90 INPUT"[DOWN]ENTER FILE NAME";N$
   :IF LEN(N$)>16 THEN 90'FMSO
92 INPUT"[DOWN](T)APE OR (D)ISK";T$
   :IF T$<>"T"AND T$<>"D"THEN 92'IKHT
94 INPUT"[DOWN]OK TO CONTINUE (Y/N)";
   OK$:IF OK$<>"Y"THEN GOSUB 168
   :SYS 49217:RETURN'ISGX
96 IF T$="T"THEN POKE 49540,1'EJUP
98 IF T$="D"THEN POKE 49540,8'EJLR
100 L=LEN(N$):FOR K=1 TO L
    :POKE 52223+K,ASC(MID$(N$,K,
    1)+CHR$(0)):NEXT'MGOJ
101 POKE 49547,L'BHCX
102 PRINT CHR$(147):RETURN'DGVA
104 FOR X=0 TO 4:PRINT:NEXT
    :PRINT CHR$(5)SPC(8)"CUSTOM
    [SPACE2]SCREEN[SPACE2]
    DESIGNER"'ILAM
110 FOR X=1144 TO 1183:POKE X,42
    :POKE X+54272,2:NEXT'HYNF
112 FOR X=1544 TO 1583:POKE X,42
    :POKE X+54272,4:NEXT'HYXH
114 FOR X=0 TO 4:PRINT:NEXT'FFIE
115 PRINT CHR$(5)SPC(6)"DO YOU WANT
    INSTRUCTIONS (Y/N)[SPACE6]"'DFJM
116 GET A$:IF A$="Y"THEN PRINT
    CHR$(147):GOSUB 124:RETURN'IPKK
118 IF A$="N"THEN RETURN'ECMH
120 SYS 49486:FOR X=0 TO 200:NEXT
    :GOTO 116'GQND
122 GOSUB 58:PRINT CHR$(147)'DIDC
124 POKE 53280,6:POKE 53281,6
    :POKE 212,0'DVRG
126 PRINT CHR$(19)CHR$(5)"[DOWN]
    F 1 - MEMORIZES THE SCREEN"'DHUN
128 PRINT"[DOWN]F 2 - RECALLS THE
    MEMORIZED SCREEN"'BAAO
130 PRINT"[DOWN]F 3 - FLIPS THE
    SCREEN ON THE X AXIS"'BAFH
132 PRINT"[DOWN]F 4 - FLIPS THE
    SCREEN ON THE Y AXIS"'BAHJ
134 PRINT"[DOWN]F 5 - REVERSES
    CHARACTERS ON THE SCREEN"'BAWM
136 PRINT"[DOWN]F 6 - DISPLAYS THIS
    HELP SCREEN"'BAGM
138 PRINT"[DOWN]F 7 - LOADS A
    PREVIOUSLY SAVED SCREEN"'BAPQ
140 PRINT"[DOWN]F 8 - SAVES THE
    SCREEN TO DISK OR TAPE"'BACJ
142 PRINT"[DOWN]CTRL + B - CHANGES
    THE BORDER COLOR"'BAOK
144 PRINT"[DOWN]CTRL + V - CHANGES
    THE BACKGROUND COLOR"'BAWN
146 PRINT SPC(7)"[DOWN3]
    PRESS ANY KEY TO CONTINUE"
    :WAIT 197,4'DIDP
148 PRINT CHR$(147):PRINT"[DOWN]
    TO CREATE A SCREEN,
     YOU MAY USE ANY OF"'DGHU
150 PRINT"[DOWN]THE LETTERS, NUMBERS,
     OR GRAPHICS"'BABJ
152 PRINT"[DOWN]CHARACTERS ON THE
    KEYBOARD. ALL THE"'BAEL
154 PRINT"[DOWN]KEYS, SUCH AS THE
    CURSOR AND INST/DEL"'BAOO
156 PRINT"[DOWN]KEYS, WILL BEHAVE AS
    THEY SHOULD."'BAXP
158 PRINT"[DOWN]TO CHANGE THE COLOR
    OF THE CURSOR,"'BAYR
160 PRINT"[DOWN]USE THE STANDARD CTRL
    KEY WITH A NUMBER"'BATM
162 PRINT"[DOWN]KEY, OR THE COMMODORE
    KEY WITH A NUMBER"'BAVO
164 PRINT SPC(7)"[DOWN3]
    PRESS ANY KEY TO CONTINUE"
    :WAIT 197,4'DIDP
166 SYS 34770:POKE 198,0
    :PRINT CHR$(19):RETURN'FRRN
168 PRINT CHR$(19):POKE 53280,Z
    :POKE 53281,Z1:RETURN'FWXQ
170 B=0:FOR X=49152 TO 49645:GOSUB 500
    :B=B+A:POKE X,A:NEXT:'JDYN
172 FOR X=34770 TO 34846:GOSUB 500
    :B=B+A:POKE X,A:NEXT'IYTO
174 IF B<>76098 THEN PRINT"DATA ERROR"
    :END'GHGO
176 RETURN'BAQI
236 OPEN 15,8,15:INPUT#15,U,V$
    :PRINT#15,"I"'DTSK
238 IF U=0 THEN CLOSE 15:RETURN'FFEL
240 PRINT CHR$(147):PRINT U,V$'DKBE
241 PRINT CHR$(17)" PRESS ANY KEY TO
    CONTINUE"CHR$(19)'DIGL
242 CLOSE 15:WAIT 197,4:POKE 198,0
    :RETURN'EPFH
500 REM MOVE TO MEMORY'BMPD
520 READ A$'BCKB
530 LM=ASC(MID$(A$,2,1))'DMGG
540 HM=ASC(MID$(A$,1,1))'DMBH
550 LM=LM-48:IF LM>9 THEN LM=LM-7'HPAM
560 HM=HM-48:IF HM>9 THEN HM=HM-7'HPFN
580 A=HM*16+LM'DHVK
592 RETURN'BAQK
910 DATA A9,00,85,02,85,FD,85,FB'BXAJ
920 DATA A9,80,85,03,A9,E9,85,04'BXYK
930 DATA A9,83,85,05,A9,04,85,FE'BXRL
940 DATA A9,D8,85,FC,A0,00'BRCL
1000 DATA B1,FD,91,02,B1,FB,91,04'BXWX
1001 DATA C0,E8,F0,10,C8,C0,00,D0'BXNY
1002 DATA EF,E6,03,E6,05,E6,FE,E6'BXDA
1003 DATA FC,4C,1C,C0,A5,FE,C9,07'BXEB
```

```
1004 DATA D0,EA,60,A9,FD,8D,21,C0'BXIC
1005 DATA A9,02,8D,1F,C0,A9,FB,8D'BXSD
1006 DATA 25,C0,A9,04,8D,23,C0,20'BXLE
1007 DATA 00,C0,A9,FD,8D,1F,C0,A9'BXJF
1008 DATA 02,8D,21,C0,A9,FB,8D,23'BXCG
1009 DATA C0,A9,04,8D,25,C0,60,20'BXMH
1010 DATA 00,C0,A9,00,85,02,A9,80'BXVY
1011 DATA 85,03,A9,E9,85,04,A9,83'BXCA
1012 DATA 85,05,A9,C0,85,FB,85,FD'BXWB
1013 DATA A9,07,85,FC,A9,DB,85,FE'BXIC
1014 DATA A2,00,A0,00,B1,02,91,FB'BXID
1015 DATA B1,04,91,FD,C8,C0,28,D0'BXCE
1016 DATA F3,E8,E0,19,F0,31,18,A5'BXSF
1017 DATA 02,69,28,85,02,B0,03,4C'BXNG
1018 DATA B2,C0,E6,03,18,A5,04,69'BXUH
1019 DATA 28,85,04,B0,03,4C,C0,C0'BXKI
1020 DATA E6,05,38,A5,FB,E9,28,85'BXJA
1021 DATA FB,85,FD,90,03,4C,90,C0'BXJB
1022 DATA C6,FC,C6,FE,4C,90,C0,60'BXRC
1023 DATA A9,00,85,02,85,04,8D,FE'BXFD
1024 DATA 03,A9,04,85,03,A9,D8,85'BXRE
1025 DATA 05,A0,00,A2,27,B1,02,9D'BXBF
1026 DATA 00,80,B1,04,9D,E9,83,C8'BXEG
1027 DATA CA,E0,FF,D0,F0,18,A5,02'BXCH
1028 DATA 69,28,85,02,85,04,B0,03'BXFI
1029 DATA 4C,0D,C1,E6,03,E6,05,18'BXKJ
1030 DATA AD,EE,C0,69,28,8D,EE,C0'BXNB
1031 DATA 90,03,EE,EF,C0,18,AD,F3'BXNC
1032 DATA C0,69,28,8D,F3,C0,90,03'BXED
1033 DATA EE,F4,C0,EE,FE,03,AD,FE'BXGE
1034 DATA 03,C9,19,F0,03,4C,E7,C0'BXMF
1035 DATA 20,41,C0,A9,00,8D,EE,C0'BXRG
1036 DATA A9,80,8D,EF,C0,A9,E9,8D'BXJH
1037 DATA F3,C0,A9,83,8D,F4,C0,60'BXLI
1038 DATA 20,00,C0,A9,00,85,02,A9'BXPJ
1039 DATA 80,85,03,A0,00,B1,02,C9'BXRK
1040 DATA 20,F0,06,C9,A0,F0,02,49'BXNC
1041 DATA 80,91,02,C8,C0,E8,F0,09'BXCD
1042 DATA C0,00,D0,E9,E6,03,4C,59'BXME
1043 DATA C1,A5,03,C9,83,D0,F1,20'BXFF
1044 DATA 41,C0,60,A9,01,A2,00,A0'BXUG
1045 DATA 01,20,BA,FF,A9,00,A2,00'BXDH
1046 DATA A0,CC,20,BD,FF,60,A9,00'BXWI
1047 DATA 85,02,A9,80,85,03,A9,02'BXUJ
1048 DATA A2,21,A0,88,20,D8,FF,60'BXLK
1049 DATA 38,20,F0,FF,60,20,81,C1'BXRL
1050 DATA A9,00,20,D5,FF,60,A9,B8'BXGD
1051 DATA 85,02,A9,88,85,03,A9,A1'BXSE
1052 DATA 85,04,A9,8C,85,05,A9,00'BXPF
1053 DATA 85,FD,85,FB,A9,04,85,FE'BXUG
1054 DATA A9,D8,85,FC,20,1C,C0,60'BXGH
1055 DATA A9,C1,8D,57,C0,A9,B4,8D'BXHI
1056 DATA 56,C0,20,41,C0,A9,C0,8D'BXFJ
1057 DATA 57,C0,A9,00,8D,56,C0,60'BXWK
1058 DATA A9,00,85,02,85,FD,85,FB'BXAL
1059 DATA A9,80,85,03,A9,E9,85,04'BXYM
1060 DATA A9,83,85,05,A9,04,85,FE'BXRE
1061 DATA A9,D8,85,FC,A0,00,B1,02'BXWF
1062 DATA 91,FD,B1,04,91,FB,C0,E8'BXYG
1063 DATA F0,10,C8,C0,00,D0,EF,E6'BXKH
1064 DATA 03,E6,05,E6,FE,E6,FC,4C'BXWI
1065 DATA EE,87,A5,FE,C9,07,D0,EA'BXQJ
1066 DATA AD,1F,88,8D,20,D0,AD,20'BXQK
1067 DATA 88,8D,21,D0,60'BOQJ
```

END

Continued from pg. 16

hundreds of dollars cheaper.

- Programs that require 256K on the PC are not four times better than those that fit comfortably into 64K on the Commodore machines.
- They are four times more expensive, and usually more than that.
- There's not much good, free software.
- The BASIC takes getting used to. There are many new statements and commands, and many of the familiar ones do unfamiliar things.
- There's a silly little synthesizer, with one monotonous voice. No harpsichords here, folks!
- BASIC graphics are similar to those on the 128, but there aren't any sprites.
- It's *much* harder to work with screen and character colors.
- The technical documentation is overwhelming and opaque. The non-technical is oversimplified and a pain.
- The magazines are full of ads and product reviews, empty of type-in programs and devoid of the goodies you find in this column.

Louis F. Sander
Pittsburgh, Pennsylvania

PC compatibility: Many Commodore owners have access to some sort of IBM PC or clone, or can see such access in their future. I recently added a clone to my computer room and have found some products that make it much easier to work with the combined equipment.

The first is Omnitronix's IBM TO CBM Printer Port Adapter. This cable and software convert the PC's parallel printer port to a Commodore-compatible printer port. With it I can use my Commodore DPS-1101 daisywheel and MPS-801 dot matrix printers with the new PC. Think how much money I saved by not buying two new printers!

Both printers work fine with my clone, and there's very rarely a hangup. I can list programs, dump text screens, and do all the other common printer tasks, but I haven't attempted graphics. My word processor drives the DPS-1101 without any problems.

The IBM TO CBM is made by Omnitronix, 760 Harrison Street, Seattle, WA 98109. It's available from them or from their dealers.

Another valuable product is *Big Blue Reader*, a program that lets the 128 and 1571 read and create MS-DOS compatible disks. (MS-DOS is the PC's disk handling system.) I have the so-called (and misnamed) CP/M version of *Big Blue Reader*, which is more costly and more useful than the standard version. It doesn't use CP/M at all—it just has the additional capability to deal with CP/M diskettes. But it also has other features that make it better than the original. Using *Big Blue Reader*, I'm able to move my *Easy Script* files and my Microsoft *Multiplan* spreadsheets over to my clone, where they can be processed by the more powerful software. I'm also able to move files from the clone to the 128.

Big Blue Reader is available from dealers and from S.O.G.-W.A.P. Software, 611 Boccaccio Avenue, Venice, CA 90291. By the time you read this, a 64 version may be on the market.

If you plan to get a PC in the future, you might want to start buying double-sided double-density disks right now. They will work with all Commodore drives, are the preferred disk for the 1571 in 128 mode and can be easily reformatted to work with MS-DOS. They're often just a little more costly than SSDD's.

Although I haven't tried it myself, it's been reported that the 1902 monitor is compatible with the PC's Color Graphics Adapter (CGA) mode. It's *not* compatible with monochrome or EGA modes, however. Commodore's new 2002 may be even more compatible. If you own one of these monitors, look into compatibility before acquiring your PC; you could save hundreds of dollars by avoiding a monitor purchase.

Louis F. Sander
Pittsburgh, Pennsylvania

Burning in: Modern electronic equipment is extremely reliable, and for many of us service calls are a thing of the past. In fact, if a newly-manufactured piece of equipment is going to fail at all during its life, it will probably fail during its first few hours of operation. Where reliability is important, it's common to "burn in" new equipment by letting it run for several days, with periodic operational checks.

You can burn in your own new equipment, with several advantages to you. All you have to do is turn the equipment on, and leave it on all day and all night. It's desirable, but not necessary, to have it doing some innocuous task. To be on the safe side, somebody should be there with it if possible, in case something starts to smoke.

From time to time, put the equipment through its paces to see if anything has failed. If it comes with a diagnostic program, run it. If not, do something that exercises the major features. When the burn-in period is finished, repeat these tests once again.

The length of the burn-in period is up to you, but the longer the burn in, the better. It should be something between a few hours and two or three days or more. Remember, you want to give the equipment every chance to fail during its critical first hours of operation.

Here are the advantages of burning in. First, you put in enough hours during the warranty period to decrease the chance of later out-of-warranty failure. Second, if the product fails so soon you can take it back to the retailer while he still remembers your purchase. And third, you get a head start on learning your equipment and its quirks.

Willem Anders
Marietta, Ohio

Doodle picture loading: Have you ever wanted to load a *Doodle* picture without loading the main program? Well you can do it with this simple program:

```
10 IF A=0 THEN A=1 : LOAD"DDFILENAME",8,1
20 POKE 56578,3 : POKE 56576,6
30 POKE 53272,PEEK(53272) OR 8
40 POKE 53272,(PEEK(53272) AND 15) OR 112
50 POKE 53265,PEEK(53265) OR 32
```

When you run it, the *Doodle* picture "FILENAME" should appear on the screen. It's necessary, in line 10, to prefix "FILENAME" with "DD", since *Doodle* assigns those characters as a prefix to the names of all its picture files.

Chris Price
Pensacola, Florida

Doodle color printouts: If you have several colored ribbons for your printer, here's a way to get more colorful pictures from your *Doodle* program. First print the picture in one color, say black, in the normal way. Then change ribbons and use the "photo negative" feature of the Doodle program. Align your paper to its position at the start of the first printout, then reprint it in the new

color, which will fill in all the blank spaces.

If your paper is in a slightly different position on the second pass, the resulting color-free and overlap areas can add highlights and texture to your picture.
Steve Martin
Camarillo, California

Aztec trick: I'm a fanatic of this game, and have gotten the idol 17 times, receiving a reward of $19,392,550. How? I discovered the following formula for getting to the idol without going through the typical dinosaurs, snakes, spiders, leopards, scorpions, Indians and carnivorous plants. You still need to be agile, clever and lucky, but your enemies will be a lot fewer.

When you're in the entrance, press the space bar and turn left before going down the stairs. Crawl and place some dynamite, but not too close to the wall. Cover yourself immediately, but don't go down the stairs. When the dynamite explodes, walk toward the hole in the wall and don't stop. Finally, you'll be in the idol's room. Open all the boxes you see, since one of them holds the idol.

If you're trapped in a room and the walls are closing in, just press the F1 key for instructions. To exit, press "R." Automatically, the closed wall will open. If you're close to it, you're out.
Alain Portmann
Santiago de Chile
Chile

One-On-One tip: When playing this popular game against the computer, it is always better to stay near the backboard facing in the direction of your opponent. Most of the time he will run into you, drawing an offensive charging foul. When these fouls accumulate to five, you get to shoot two free throws. The strategy only works when your opponent is the computer, has rebounded the ball and is trying to score on you. Don't try it against a human opponent!
Stephan Lutz
San Pedro Sula
Honduras

Game map maker: A good map of all the locations in an adventure game is very important to the serious adventurer. This program, for use with any Commodore system and most compatible printers, will print 154 blank location squares on a single sheet of paper.

After typing in the program, save it to disk or tape. Run it and relax while the printer does its work. To use the maps, fill in the boxes with a short description of each known location. Draw arrows to show the exits and entrances for each room. For up and down, I use a small letter "U" or "D" beside the arrow.

If a series of rooms can be reached only from one location, I find it easier to map these rooms separately from the main game map.
Bradley L. Dina
Euclid, Ohio

```
100 PRINT"[CLEAR,RVS,SPACE7]
    GAME MAP - BRADLEY L. DINA[SPACE7]
    "
110 PRINT"[DOWN2] READY THE PRINTER,
     THEN PRESS 'P'..."
120 GET A$:IF A$<>"P"THEN 120
```

```
130 B$=CHR$(255)+CHR$(26)
140 OPEN 4,4,10:CLOSE 4
150 OPEN 4,4:PRINT#4,CHR$(27);"P"
160 FOR Y=1 TO 14
170 PRINT#4,CHR$(8);
180 B=129:GOSUB 260
190 B=128:FOR J=1 TO 3:GOSUB 260:NEXT
200 B=192:GOSUB 260
210 FOR J=1 TO 3:PRINT#4:NEXT
220 NEXT
230 PRINT#4,CHR$(12):CLOSE 4
240 END
250 :
260 FOR X=1 TO 11:D=14:IF X=11 THEN
    D=10
270 GOSUB 280:NEXT:RETURN
280 PRINT#4,B$;CHR$(28);CHR$(B);B$;
    CHR$(D);CHR$(128);
290 RETURN
```

Character format conversions: In the non-Commodore computer world, the ASCII code is often used for transferring text from place to place. For example, word processors often save text to disk in ASCII, and BASIC uses ASCII codes in CHR$ statements.

In the Commodore world, we use a somewhat different code, often called PETASCII (from its original use in Commodore's PET computer) for these purposes. When poking characters to the screen, Commodore computers use yet another code, often called the Screen Poke Code.

All three codes work in the same general way—each displayable character has a unique numeric code that can be easily handled internally by the computer. But unfortunately there are significant differences in the codes. For example, a lower case "a" is represented by 97 in ASCII, 65 in PETASCII, and 1 in Screen Poke. Since programmers frequently need to convert data from one of these formats to another, there's a real need for computer algorithms to make the conversion.

The accompanying listing contains user-defined functions that can be used to convert any of these formats to any other. Once your program executes lines 170-250, you can use the functions to make the conversions.

The functions have been named to make it easy to know their purpose. FNPS from PETASCII to Screen Poke. FNSP converts from Screen Poke to PETASCII. FNPA converts from PETASCII to ASCII and as an added bonus also converts ASCII to PETASCII. Say, for example, that you want to convert PETASCII 97 to its Screen Poke equivalent and to store the result in variable A. Just execute A = FNPS(97).

When using these functions, you should keep some important points in mind:

- When converting text, the Commodore should be in upper and lower case mode, *not* graphics mode.
- PETASCII codes from 0-31 and 128-159 have no corresponding screen pokes. FNPS converts them to 32's (spaces).
- Screen Poke codes greater than 127 (for RVS characters) have no corresponding PETASCII codes. FNSP converts them to the PETASCII codes of their unreversed equivalents.
- PETASCII and ASCII differ greatly in the meanings of control codes 0-31, and somewhat in characters 92, 94, 95, 96 and 123-127. FNPA makes no conversions on any of those codes.
- ASCII has no codes greater than 127, while PETASCII goes all the way up to 255. Where PETASCII codes above 127 can be converted to ASCII equivalents, FNPA makes the conversion. It changes unconvertible PETASCII characters to ASCII 126's (tildes).

Louis F. Sander
Pittsburgh, Pennsylvania

```
100 REM ** CHARACTER FORMAT
    CONVERSIONS
110 REM ** LOUIS F. SANDER,
     AUGUST 1987
120 :
130 REM FNPS(X) - PETASCII TO SCREEN
    POKE
140 REM FNSP(X) - SCREEN POKE TO
    PETASCII
150 REM FNPA(X) - PETASCII/ASCII AND
    BACK
160 :
170 DEF FN A1(X)= X-161-33*(X<255)
    -64*(X<192)-32*(X<160)+32*(X<96)
    -64*(X<64)
180 DEF FN A2(X)= ABS(X*(X<128 OR
    X>159))-32*(X>127 AND
    X<160)-(32-X)*(X<32)
190 DEF FN A3(X)= X-64*(X<32 OR
    X>95)-32*(X>63 AND X<96)
200 DEF FN A4(X)= X AND 127
210 DEF FN A5(X)= X+(X*(X>127))-126*
    (X>127)
220 DEF FN A6(X)= X-32*(X>64 AND
    X<91)+32*(X>96 AND
    X<123)+128*(X>192 AND X<219)
230 DEF FN PS(X)= FN A1(FN A2(X))
240 DEF FN SP(X)= FN A3(FN A4(X))
250 DEF FN PA(X)= FN A5(FN A6(X))
```

Marking telephone cables: If you use a modem, you probably do a lot of plugging and unplugging of modular telephone cords. There's one from the line to the modem, one from the modem to the telephone, and often several more. Making the modular connections is easy, but identifying the proper cord can be a real nightmare. They all have identical connectors, and they all are made of similar-colored cable.

I've solved the problem by using a Sharpie brand marker to label the ends of every modular cable in my computer room. The Sharpie is indelible and has a fine point, while the flat modular cable is very easy to write on. If I label both sides of each end of the cable, I can tell at a glance exactly what it is.

Fred Rednas
Charleston, South Carolina

Q-Link multitasking: While typing an on-line message or E-Mail, you can still interact with others in People Connection or in a conference.

If you press F7 while working on your message, the system will give you a Help prompt for E-Mailing or OLM'ing, but in

Continued on pg. 128

Continued from pg. 34

treasures are won't really matter much, since getting there will prove hard enough. Be warned, this is not a game for the young or easily frustrated. But if you're looking for a fast-paced game that will test as well as reward your arcade prowess, then *Cauldron*'s brew just might be your cup of tea.

Pot Luck

As I mentioned in the review, simply trying to move the characters around the screen will undoubtedly cause fits for most beginners. It would benefit newcomers to initially forget about score and advancement, and to take a dozen rounds just to get the feel of the wild witch and awkward pumpkin. Control is tough, but since it is both consistent and evenutally predictable, it's not impossible. After you've gotten the hang of surrogate steering, check the tips I've listed below. They should have you sailing along to victory with leaps and bounds.

- When using your broomstick to move from one location to another in *Cauldron I*, you will meet the least amount of enemy resistance if you travel at the highest possible altitude. The PumpKing's henchmen (i.e., bats, birds, ghosts and soldiers) swarm up from the ground whenever they sense your presence. If you sail along the screen's upper edge, the enemy will not be able to ascend quickly enough to impede your forward progress. The high flying tactic will help save time, energy and lives.
- Keep a watchful eye on your witch's energy level. If she's aboard her broomstick when the gauge drains down to zero, the next enemy hit will send her into a tailspin. But even as she plummets to her death, if you can manage to direct her across the path of a magic key, it will still be collected and counted toward her recipe requirements. A minor consolation, perhaps, but it's one step closer to victory.
- When you become a skilled enough witch pilot that you can hover the broomstick motionless above the landscape, then you might notice an interesting control nuance. If you want to move your craft a short distance in one direction, it can be accomplished by tapping your joystick a couple of times in the *opposite* direction. This reverse gear factor is a side effect of the game's inertia simulation, and is actually easier to execute than trying to nudge your witch forward in the conventional manner.
- If you're persistent and lucky enough to have advanced to the climactic bottom corridor of the castle in *Cauldron II*, make sure to keep your bouncing under control. The ceiling of this final hallway is actually a one-way trapdoor. If your pumpkin bounces too high and too hard, there is a good chance it will break right through the overhead structure, sealing it in a compartment that has no escape.
- To help the player deal with a no-escape situation like the one mentioned above, Broderbund's designers have been thoughtful enough to include a special "relocation" key. By pressing "R" on the keyboard, your surrogate, at the cost of a life, will be removed from his trapped position and placed in a safer castle location. Aside from its intended use, this button also has an inadvertent use that's even more valuable. If you push the "R" key just after your pumpkin has met his demise, he will be immediately resurrected without a life loss registering with the program. If you're a quick enough key puncher, there's a good chance that your allocation of six pumpkins will last forever.

Continued from pg. 61

64 Main Program

```
5 REM C-64 MAIN PROG    JOHN
  IOVINE'BWPJ
10 PRINT CHR$(142):REM SWITCH UPPER
   CASE'DVNE
30 POKE 56334,PEEK(56334)AND 254'DQQE
70 FOR J=12288 TO 12288+32
   : REM PLACE CHARACTER DATA IN
   RAM'FMIP
80 READ A:POKE J,A:NEXT'DGMH
100 POKE 56334,PEEK(56334)OR 1'DORY
120 DATA,0,0,0,0,0,0,0,0:REM @'CSHB
130 DATA 255,255,255,255,0,0,0,0'BXFC
140 DATA 0,0,0,0,255,255,255,255'BXFD
150 DATA 255,255,255,255,255,255,255,
    255'BGAG
160 B=0'BCKC
162 POKE 53281,1:POKE 53282,15
    :POKE 53283,12:POKE 53284,11'EJOM
165 POKE 53265,PEEK(53265)OR 64'DPYK
170 REM MENU'BEUD
180 PRINT"[CLEAR]"'BATE
190 PRINT:PRINT:PRINT:PRINT'EDSH
200 PRINT"[SPACE19]DIGITAL CAMERA
    MENU"'BAME
210 PRINT:PRINT:PRINT'DCMY
215 PRINT " 1) INSTRUCTIONS"'BAUG
220 PRINT" 2) LOAD B/W FAST SCAN
    CAMERA"'BAYF
225 PRINT" 3) LOAD G/S GRAY SCALE
    CAMERA"'BAYK
230 PRINT" 4)[SPACE4]SET/RESET TIMING
    B/W MODE"'BAVH
235 PRINT" 5)[SPACE4]SET/RESET TIMING
    G/S MODE"'BAXM
240 PRINT" 6)[SPACE4]COLORATION
    [SPACE2]G/S"'BATF
250 PRINT" 7) START CAMERA"'BAGF
255 PRINT" 8) QUIT"'BAFI
260 PRINT:PRINT"INPUT OPTION NUMBER
    1-8"'CBRJ
261 FOR T=0 TO 175:NEXT T'EHIH
262 POKE 197,64:POKE 198,0'CMGH
265 INPUT X:IF X<1 THEN 280
    :IF X>8 THEN 280'HNBO
270 ON X GOTO 290,300,400,500,600,700,
    800,900'CHPK
280 PRINT"ERROR, PLEASE ENTER NUMBER
    BETWEEN 1-8":GOTO 265'CERQ
290 GOTO 910'BDJG
300 CLR'BAFW
301 LOAD"64 B/W CAM",8'BCPB
400 CLR'BAFX
401 LOAD"64 GRAY CAM",8'BCXC
500 PRINT"[CLEAR]"'BATA
501 PRINT:PRINT:PRINT'DCMC
502 PRINT"[SPACE4]RESET / SET
    TIMING"'BAMG
503 PRINT"[SPACE3]FAST SCAN B/W
    CAMERA"'BAUI
504 PRINT:PRINT"NUMBERS REPRESENT
    DELAY IN MILLISECONDS"'CBKP
505 PRINT"[SPACE10]BETWEEN SCREEN
    SCANS"'BAIL
506 PRINT:PRINT"DEFAULT DELAY IS 16
    MILLISECONDS"'CBFP
507 G=PEEK(49574)'CIZJ
508 PRINT"CURRENT DELAY IS ";G'BCHM
509 INPUT" ENTER DELAY";G'BCLM
510 POKE 49574,G'BHXC
511 PRINT:PRINT"THANK YOU"'CBHF
512 FOR T=1 TO 500:NEXT T'EHBG
513 GOTO 180'BDIE
600 PRINT"[CLEAR]"'BATB
601 PRINT:PRINT:PRINT'DCMD
602 PRINT"[SPACE3]SET / RESET
    TIMING"'BAFH
603 PRINT"NUMBERS REPRESENT DELAY IN
    MILLISECONDS"'BAFO
604 PRINT"[SPACE11]BETWEEN GRAY
    SCANS"'BADK
605 PRINT:PRINT'CBHG
606 J=PEEK(49569):K=PEEK(49885)
    :L=PEEK(49917)'GBMP
607 PRINT:PRINT" 1ST SCAN IS
    NON-ADJUSTABLE"'CBVP
608 PRINT:PRINT" 2ND SCAN DEFAULT
    DELAY IS[SPACE3]7"'CBCQ
609 PRINT"CURRENT DELAY IS ";J'BCKO
610 INPUT"ENTER DELAY";J'BCHF
611 PRINT:PRINT" 3RD SCAN DEFAULT
    DELAY IS 28"'CBUK
612 PRINT"CURRENT DELAY IS ";K'BCLI
613 INPUT"ENTER DELAY";K'BCII
614 PRINT:PRINT" 4TH SCAN DEFAULT
    DELAY IS 72"'CBBN
615 PRINT"CURRENT DELAY IS ";L'BCML
616 INPUT"ENTER DELAY";L'BCJL
617 POKE 49569,J:POKE 49885,K
    :POKE 49917,L'DXGO
618 PRINT"[SPACE3]THANK YOU"'BAWM
619 FOR T=1 TO 500:NEXT T'EHBO
620 GOTO 180'BDID
700 PRINT"[CLEAR]"'BATC
701 PRINT:PRINT:PRINT'DCME
702 PRINT"[SPACE4]COLOR CODES"'BAWH
703 PRINT'BACE
704 PRINT"0 BLACK"," 8 ORANGE"'BBDJ
705 PRINT"1 WHITE"," 9 BROWN"'BBNK
706 PRINT"2 RED","10 LIGHT RED"'BBSL
707 PRINT"3 CYAN","11 DARK GRAY"'BBWN
708 PRINT"4 PURPLE","12 MEDIUM
    GRAY"'BBEP
709 PRINT"5 GREEN","13 LIGHT
    GREEN"'BBQQ
710 PRINT"6 BLUE","14 LIGHT BLUE"'BBBH
711 PRINT"7 YELLOW","15 LIGHT
    GRAY"'BBPJ
712 PRINT:PRINT'CBHF
714 PRINT"DEFAULT COLOR FOR 1ST SCAN
    IS[SPACE2]1"'BAXO
715 INPUT"ENTER COLOR CODE # ";C'BCEM
716 PRINT'BACI
717 PRINT"DEFAULT COLOR FOR 2ND SCAN
    IS 15"'BAAR
718 INPUT"ENTER COLOR CODE # ";D'BCFP
```

```
719 PRINT'BACL
720 PRINT"DEFAULT COLOR FOR 3RD SCAN
    IS 12"'BACL
721 INPUT"ENTER COLOR CODE # ";E'BCGJ
722 PRINT'BACF
723 PRINT"DEFAULT COLOR FOR 4TH SCAN
    IS 11"'BAIO
724 INPUT"ENTER COLOR CODE # ";F'BCHM
725 PRINT'BACI
726 PRINT"DEFAULT COLOR FOR BKGRD IS
    [SPACE2]0"'BARR
727 INPUT"ENTER COLOR CODE # ";B'BCDP
728 POKE 53281,C:POKE 53282,D
    :POKE 53283,E:POKE 53284,F'EGVT
729 PRINT:PRINT" THANK YOU"'CBNQ
730 FOR T=1 TO 500:NEXT T'EHBI
731 GOTO 180'BDIG
800 G=PEEK(53272):POKE 53272,
    (PEEK(53272)AND 240)+12'GEYL
801 PRINT"[CLEAR]":FOR L=55296 TO
    56295:POKE L,B:NEXT:SYS 49233'HXUM
802 POKE 53272,G:GOTO 1000'CMTH
900 END'BACD
910 PRINT"[CLEAR]"'BATF
912 PRINT:PRINT:PRINT:PRINT'EDSJ
914 PRINT"[SPACE2]DIGITAL CAMERA
    INSTRUCTIONS"'BAQQ
916 PRINT"[SPACE21]PG1"'BAEO
918 PRINT:PRINT'CBHN
920 PRINT"THE DIGITAL CAMERA PROGRAM
    PROVIDES"'BARP
922 PRINT"THREE COMMANDS THAT CAN BE
    UTILIZED"'BAVR
924 PRINT"DURING CAMERA
    OPERATION.(ON-THE-FLY)"'BAUT
926 PRINT"THESE COMMANDS ARE AS
    FOLLOWS:"'BABT
928 PRINT'BACN
930 PRINT"PRESS > KEY TO INCREASE
    TIMING"'BALO
932 PRINT"PRESS < KEY TO DECREASE
    TIMING"'BAUQ
934 PRINT"PRESS R KEY TO RETURN TO
    MENU"'BAVS
936 PRINT'BACM
938 PRINT"THE TIMING KEYS OPERATE
    WITH BOTH"'BADX
940 PRINT"B/W AND GRAY CAMERAS."'BADN
942 PRINT"THE KEYS WILL INCREMENT OR
    DECREMENT"'BAMT
944 PRINT"THE OVERALL SCAN TIMING BY
    ONE"'BACT
946 PRINT"MILLISECOND PER SCREEN SCAN
    THAT THE"'BAEX
948 PRINT"KEY IS HELD."'BADS
950 PRINT"IN THE GRAY CAMERA MODE,
     THIS MEANS"'BAXR
952 PRINT"THAT EACH OF THE THREE GRAY
    SCALE"'BAMT
954 PRINT"TIMING MODES ARE
    SIMULTANEOUSLY CHANGED"'BAOX
956 PRINT:PRINT"PRESS ANY KEY TO
    CONTINUE"'CBCW
958 GET A$'BCGR
```

```
960 IF A$=""THEN 958'DFNL
962 PRINT"[CLEAR]"'BATM
964 PRINT:PRINT:PRINT'DCMP
966 PRINT"[SPACE3]DIGITAL CAMERA
    INSTRUCTIONS"'BAXX
968 PRINT"[SPACE23]PG 2"'BAAV
970 PRINT:PRINT'CBHL
972 PRINT"BY PRESSING THE R KEY,
     THE PROGRAM"'BAMV
974 PRINT"WILL RETURN TO THE BASIC
    MENU. HERE"'BAAX
976 PRINT"FURTHER ADJUSTMENTS IN
    TIMING ARE "'BAEA
978 PRINT"POSSIBLE BY ALLOWING THE
    USER TO FIRST"'BADE
980 PRINT"READ THE TIMING SCANS
    BEFORE ADJUSTING"'BARV
982 PRINT"PSEUDO-COLORATION OF THE
    GRAY SCALES"'BAWX
984 PRINT"IS IMPLEMENTED BY CHOOSING
    THE COLORATION"'BACB
986 PRINT"ITEM ON THE MENU.
    COLORATION OF THE B/W"'BAYC
988 PRINT"CAMERA IS POSSIBLE,
     THE FIRST AND LAST"'BALE
990 PRINT"COLORS ENTERED ON THE
    COLORATION MENU"'BAWW
992 PRINT"WILL BE DISPLAY WITH THE
    B/W CAMERA"'BAQX
994 PRINT:PRINT"[SPACE2]
    END OF INSTRUCTIONS"'CBEX
995 PRINT"PRESS ANY KEY TO RETURN TO
    MENU"'BARB
996 GET A$'BCGT
997 IF A$=""THEN 996'DFPV
998 GOTO 180'BDIV
1000 GOTO 180:REM VECTOR FOR PROGRAM
     INSERTATION'CGND
```

END

64 B/W Data

```
10 PRINT"[CLEAR]POKING -";'BBGA
20 P=49152: REM $C000 (END AT
   49654/$C1F6)'CFKF
30 READ A$:IF A$="END"THEN 110'EISD
40 L=ASC(MID$(A$,2,1))'DLEE
50 H=ASC(MID$(A$,1,1))'DLYF
60 L=L-48:IF L>9 THEN L=L-7'HKVJ
70 H=H-48:IF H>9 THEN H=H-7'HKBK
80 PRINT"[HOME,RIGHT12]"P;'BCVG
90 IF H>15 OR L>15 THEN PRINT"DATA
   ERROR IN LINE";1000+INT((P-49152)
   /8):END'LXUV
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30'JUYF
110 IF T<>62021 THEN PRINT"MISTAKE IN
    DATA -> CHECK DATA STATEMENTS"
    :END'GHUL
120 PRINT:PRINT:PRINT"LOAD
    SUCCESSFUL..."'DCAE
130 PRINT"[SPACE4]RETURNING TO MAIN
    MENU"'BAUF
140 FOR T=1 TO 500:NEXT'EGWC
150 LOAD"64 MAIN PROG",8'BCIE
1000 DATA 00,04,03,07,08,0C,0B,0F'BXIX
1001 DATA 10,14,13,17,18,1C,1B,1F'BXQY
1002 DATA 20,24,23,27,28,2C,2B,2F'BXYA
1003 DATA 30,34,33,37,38,3C,3B,3F'BXGB
1004 DATA 40,00,00,00,00,00,00,00'BXLB
1005 DATA 4C,0C,4F,0F,50,10,54,14'BXLD
1006 DATA 53,13,57,17,58,18,5C,1C'BXZE
1007 DATA 5B,1B,5F,1F,60,20,64,24'BXRF
1008 DATA 63,23,67,27,68,28,6C,2C'BXHG
1009 DATA 6B,2B,6F,2F,70,30,73,33'BXXH
1010 DATA 00,AD,02,DC,8D,25,C0,A9'BXJY
1011 DATA FF,8D,03,DD,78,A9,0B,8D'BXDA
1012 DATA 02,DC,A9,0B,8D,00,DC,8D'BXGB
1013 DATA 00,DC,A0,00,A9,0B,8D,00'BXEC
1014 DATA DC,8C,01,DD,A9,09,8D,00'BXVD
1015 DATA DC,C8,C0,7F,D0,EE,A9,0B'BXVE
1016 DATA 8D,00,DC,EA,EA,EA,EA,EA'BXIF
1017 DATA EA,A0,00,A2,00,A9,0B,8D'BXWG
1018 DATA 00,DC,B9,00,C0,8D,01,DD'BXFH
1019 DATA A9,09,8D,00,DC,A9,01,8D'BXII
1020 DATA 00,DC,BD,28,C0,EA,EA,8D'BXLA
1021 DATA 01,DD,CE,00,DC,A9,08,8D'BXIB
1022 DATA 00,DC,A9,09,8D,00,DC,E8'BXVC
1023 DATA E0,28,D0,E1,A2,00,86,FC'BXXD
1024 DATA C8,C0,21,D0,C8,A9,C8,85'BXNE
1025 DATA FA,A9,04,85,FB,4C,95,C1'BXFF
1026 DATA EA,A0,00,A2,00,A9,0B,8D'BXWG
1027 DATA 00,DC,BD,00,C0,8D,01,DD'BXQH
1028 DATA A9,09,8D,00,DC,B9,28,C0'BXJI
1029 DATA 8D,01,DD,A9,08,8D,00,DC'BXVJ
1030 DATA AD,0D,DD,C9,10,D0,60,4C'BXBB
1031 DATA B1,C1,EA,EA,C8,C0,28,D0'BXRC
1032 DATA DF,A0,00,E8,E0,21,F0,6A'BXID
1033 DATA A9,0B,8D,00,DC,BD,00,C0'BXTE
1034 DATA 8D,01,DD,A9,09,8D,00,DC'BXWF
1035 DATA B9,28,C0,8D,01,DD,A9,08'BXKG
1036 DATA 8D,00,DC,AD,0D,DD,C9,10'BXTH
1037 DATA D0,34,4C,BD,C1,EA,A9,01'BXYI
1038 DATA 8D,00,DC,C8,C0,28,D0,DB'BXHJ
1039 DATA 18,A5,FA,69,28,85,FA,A9'BXYK
1040 DATA 00,69,00,85,FC,A5,FB,65'BXSC
1041 DATA FC,85,FB,EA,EA,A0,00,EA'BXBD
1042 DATA EA,EA,E8,EA,4C,D5,C0,A9'BXME
1043 DATA 03,91,FA,4C,FA,C0,B1,FA'BXRF
1044 DATA C9,03,F0,07,A9,02,91,FA'BXNG
1045 DATA 4C,2D,C1,A9,03,91,FA,4C'BXRH
1046 DATA 2D,C1,A9,C8,85,FA,EA,EA'BXYI
1047 DATA A9,04,85,FB,AD,25,C0,8D'BXAJ
1048 DATA 02,DC,58,4C,D1,C1,EA,EA'BXUK
1049 DATA 78,A9,0B,8D,02,DC,4C,85'BXPL
1050 DATA C0,60,8D,00,DC,A0,00,8C'BXMD
1051 DATA 01,DD,A9,0B,8D,00,DC,A2'BXWE
1052 DATA CA,CA,D0,FD,C8,C0,10,D0'BXCF
1053 DATA F3,EA,EA,AD,0D,DD,4C,D0'BXRG
1054 DATA C0,A9,00,91,FA,A9,01,8D'BXAH
1055 DATA 00,DC,4C,FA,C0,B1,FA,C9'BXHI
1056 DATA 03,D0,07,A9,01,91,FA,4C'BXFJ
1057 DATA 2D,C1,A9,00,91,FA,4C,2D'BXNK
1058 DATA C1,A5,C5,C9,40,F0,0C,C9'BXSL
1059 DATA 2C,F0,0B,C9,2F,F0,0D,C9'BXJM
1060 DATA 11,F0,0F,4C,88,C1,EE,A6'BXVE
1061 DATA C1,4C,88,C1,CE,A6,C1,4C'BXLF
1062 DATA 88,C1,4C,91,C1,FF,13,
     END'BYHG
```

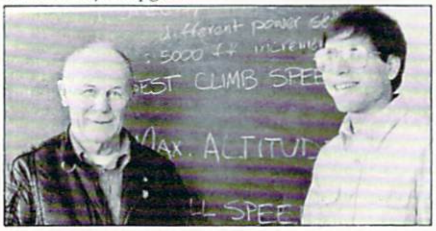
END

64 Gray Data

```
10 PRINT"[CLEAR]POKING -";'BBGA
20 P=49152: REM $CØØØ (END AT
   49971/$C333)'CFRF
30 READ A$:IF A$="END"THEN 11Ø'EISD
40 L=ASC(MID$(A$,2,1))'DLEE
50 H=ASC(MID$(A$,1,1))'DLYF
60 L=L-48:IF L>9 THEN L=L-7'HKVJ
70 H=H-48:IF H>9 THEN H=H-7'HKBK
80 PRINT"[HOME,RIGHT12]"P;'BCVG
90 IF H>15 OR L>15 THEN PRINT"DATA
   ERROR IN LINE";1ØØØ+INT((P-49152)
   /8):END'LXUV
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 3Ø'JUYF
110 IF T<>1Ø7792 THEN PRINT"MISTAKE
    IN DATA -> CHECK DATA STATEMENTS"
    :END'GIDM
120 PRINT:PRINT:PRINT"LOAD
    SUCCESSFUL..."'DCAE
130 PRINT"[SPACE4]RETURNING TO MAIN
    MENU"'BAUF
140 FOR T=1 TO 5ØØ:NEXT:CLR'FHFD
150 LOAD"64 MAIN PROG",8'BCIE
1000 DATA ØØ,Ø4,Ø3,Ø7,Ø8,ØC,ØB,ØF'BXIX
1001 DATA 1Ø,14,13,17,18,1C,1B,1F'BXQY
1002 DATA 2Ø,24,23,27,28,2C,2B,2F'BXYA
1003 DATA 3Ø,34,33,37,38,3C,3B,3F'BXGB
1004 DATA 4Ø,ØØ,ØØ,ØØ,ØØ,ØØ,ØØ,ØØ'BXLB
1005 DATA 4C,ØC,4F,ØF,5Ø,1Ø,54,14'BXLD
1006 DATA 53,13,57,17,58,18,5C,1C'BXZE
1007 DATA 5B,1B,5F,1F,6Ø,2Ø,64,24'BXRF
1008 DATA 63,23,67,27,68,28,6C,2C'BXHG
1009 DATA 6B,2B,6F,2F,7Ø,3Ø,73,33'BXXH
1010 DATA ØØ,AD,Ø2,DC,8D,C6,C2,A9'BXEY
1011 DATA FF,8D,Ø3,DD,78,A9,ØB,8D'BXDA
1012 DATA Ø2,DC,8D,ØØ,DC,AØ,ØØ,A9'BXCB
1013 DATA ØB,8D,ØØ,DC,8C,Ø1,DD,A9'BXFC
1014 DATA Ø9,8D,ØØ,DC,C8,CØ,7F,DØ'BXWD
1015 DATA EE,A9,ØØ,85,FA,85,FC,A9'BXBE
1016 DATA Ø4,85,FB,EA,AØ,ØØ,A2,ØØ'BXHF
1017 DATA A9,ØB,8D,ØØ,DC,BD,ØØ,CØ'BXTG
1018 DATA 8D,Ø1,DD,A9,Ø9,8D,ØØ,DC'BXWH
1019 DATA A9,Ø1,8D,ØØ,DC,B9,28,CØ'BXBI
1020 DATA 8D,Ø1,DD,CE,ØØ,DC,A9,Ø8'BXIA
1021 DATA 8D,ØØ,DC,EE,ØØ,DC,C8,CØ'BXUB
1022 DATA 28,DØ,E5,AØ,ØØ,E8,EE,C7'BXVC
1023 DATA C2,AD,C7,C2,C9,Ø2,DØ,C8'BXID
1024 DATA A9,ØØ,8D,C7,C2,8E,C8,C2'BXEE
1025 DATA EA,EA,EA,AØ,ØØ,AE,C8,C2'BXSF
1026 DATA CA,CA,A9,ØB,8D,ØØ,DC,BD'BXWG
1027 DATA ØØ,CØ,8D,Ø1,DD,AD,ØD,DD'BXLH
1028 DATA A9,Ø9,8D,ØØ,DC,B9,28,CØ'BXJI
1029 DATA 8D,Ø1,DD,CE,ØØ,DC,EE,ØØ'BXQJ
1030 DATA DC,AD,ØD,DD,C9,1Ø,DØ,47'BXWB
1031 DATA 4C,7A,C1,EA,C8,CØ,28,DØ'BXHC
1032 DATA E4,AØ,ØØ,E8,EØ,21,FØ,4B'BXPD
1033 DATA A9,ØB,8D,ØØ,DC,BD,ØØ,CØ'BXTE
1034 DATA 8D,Ø1,DD,AD,ØD,DD,A9,Ø9'BXCF
1035 DATA 8D,ØØ,DC,B9,28,CØ,8D,Ø1'BXDG
1036 DATA DD,CE,ØØ,DC,EE,ØØ,DC,AD'BXNH
1037 DATA ØD,DD,C9,1Ø,DØ,18,4C,81'BXBI
1038 DATA C1,EA,C8,CØ,28,DØ,DC,4C'BXWJ
1039 DATA 95,C1,EA,EA,EA,EA,EA,A9'BXBK
1040 DATA Ø3,91,FA,4C,FB,CØ,B1,FA'BXSC
1041 DATA C9,Ø3,FØ,Ø4,A9,Ø2,91,FA'BXKD
1042 DATA 4C,31,C1,A9,ØØ,85,FA,85'BXOE
1043 DATA FC,A9,Ø4,85,FB,AD,C6,C2'BXIF
1044 DATA 8D,Ø2,DC,58,A5,C5,C9,4Ø'BXLG
1045 DATA FØ,Ø3,4C,Ø8,C3,78,A9,ØB'BXNH
1046 DATA 8D,Ø2,DC,4C,84,CØ,6Ø,4C'BXDI
1047 DATA Ø8,C3,A9,Ø2,91,FA,4C,FB'BXVJ
1048 DATA CØ,B1,FA,C9,Ø2,FØ,Ø7,A9'BXNK
1049 DATA Ø1,91,FA,4C,31,C1,A9,ØØ'BXYL
1050 DATA 91,FA,4C,31,C1,8E,C8,C2'BXYD
1051 DATA AØ,ØØ,A2,CA,CA,DØ,FD,C8'BXXE
1052 DATA CØ,Ø7,DØ,F6,AE,C8,C2,AØ'BXDF
1053 DATA ØØ,4C,BB,C1,C8,CØ,ØF,DØ'BXSG
1054 DATA EF,8E,ØØ,DC,AØ,ØØ,4C,CB'BXOH
1055 DATA CØ,EA,EA,AØ,ØØ,CA,A9,ØB'BXSI
1056 DATA 8D,ØØ,DC,BD,ØØ,CØ,8D,Ø1'BXEJ
1057 DATA DD,AD,ØD,DD,A9,Ø9,8D,ØØ'BXBK
1058 DATA DC,B9,28,CØ,8D,Ø1,DD,CE'BXFL
1059 DATA ØØ,DC,EE,ØØ,DC,AD,ØD,DD'BXSM
1060 DATA C9,1Ø,DØ,Ø3,4C,8D,C2,C8'BXCE
1061 DATA CØ,28,DØ,E5,AØ,ØØ,E8,A9'BXXF
1062 DATA ØB,8D,ØØ,DC,BD,ØØ,CØ,8D'BXVG
1063 DATA Ø1,DD,AD,ØD,DD,A9,Ø9,8D'BXCH
1064 DATA ØØ,DC,B9,28,CØ,8D,Ø1,DD'BXPI
1065 DATA CE,ØØ,DC,EE,ØØ,DC,AD,ØD'BXSJ
1066 DATA DD,C9,1Ø,DØ,Ø3,4C,9D,C2'BXQK
1067 DATA C8,CØ,28,DØ,E5,EA,EA,EE'BXVL
1068 DATA C9,C2,AD,C9,C2,C9,Ø1,FØ'BXMM
1069 DATA Ø9,C9,Ø2,FØ,1A,C9,Ø3,FØ'BXIN
1070 DATA 2B,EA,A9,8Ø,8D,B2,C2,A9'BXNF
1071 DATA 81,8D,AB,C2,A9,82,8D,97'BXYG
1072 DATA C2,8D,A4,C2,4C,D1,C2,A9'BXIH
1073 DATA CØ,8D,B2,C2,A9,C1,8D,AB'BXXI
1074 DATA C2,A9,C2,8D,97,C2,8D,A4'BXIJ
1075 DATA C2,4C,F1,C2,A9,4Ø,8D,B2'BXRK
1076 DATA C2,A9,41,8D,AB,C2,A9,42'BXTL
1077 DATA 8D,97,C2,8D,A4,C2,A9,ØØ'BXMM
1078 DATA 8D,C9,C2,18,A5,FA,69,28'BXXN
1079 DATA 85,FA,A9,ØØ,69,ØØ,85,FC'BXXO
1080 DATA A5,FB,65,FC,85,FB,AØ,ØØ'BXKG
1081 DATA E8,4C,88,CØ,EA,B1,FA,C9'BXMH
1082 DATA Ø3,FØ,Ø3,4C,E7,C1,A9,42'BXHI
1083 DATA 91,FA,4C,E7,C1,B1,FA,C9'BXHJ
1084 DATA Ø3,FØ,Ø7,C9,42,FØ,ØA,4C'BXEK
1085 DATA 18,C2,A9,41,91,FA,4C,18'BXSL
1086 DATA C2,A9,4Ø,91,FA,4C,18,C2'BXEM
1087 DATA EA,ØØ,FF,ØØ,FF,ØØ,FF,ØØ'BXVN
1088 DATA FF,ØØ,ØØ,ØØ,ØØ,22,ØØ,ØØ'BXFN
1089 DATA ØØ,ØØ,ØØ,ØØ,ØØ,ØØ,ØØ,ØØ'BXHO
1090 DATA ØØ,8E,C8,C2,AØ,ØØ,A2,CA'BXAH
1091 DATA CA,DØ,FD,C8,CØ,1C,DØ,F6'BXNI
1092 DATA AE,C8,C2,AØ,ØØ,4C,BB,C1'BXIJ
1093 DATA ØØ,FF,ØØ,FF,ØØ,FF,ØØ,FF'BXCK
1094 DATA ØØ,8E,C8,C2,AØ,ØØ,A2,CA'BXAL
1095 DATA CA,DØ,FD,C8,CØ,48,DØ,F6'BXFM
1096 DATA AE,C8,C2,AØ,ØØ,4C,BB,C1'BXIN
1097 DATA A5,C5,C9,2C,FØ,ØC,C9,2F'BXOO
1098 DATA FØ,14,C9,11,DØ,Ø1,6Ø,4C'BXIP
1099 DATA 6D,C1,EE,A1,C1,EE,DD,C2'BXFQ
1100 DATA EE,FD,C2,4C,6D,C1,CE,A1'BXIY
1101 DATA C1,CE,DD,C2,CE,FD,C2,4C'BXXA
1102 DATA 6D,C1,FF,END'BMMY
```

END

Continued from pg. 69



actually serve a very useful purpose. Each one of these mystery planes needs to be analyzed by a trained test pilot, so the user can literally assume the role of Chuck Yeager and learn what makes these planes tick. For the record, my favorite airplane in the program is the Grace Industries XPG-12 Samurai. It was named after Paul Grace, the assistant producer of the project and flies like a dream.

Building on what you've learned from your previous assignments, in Formation Flying the pilot travels through obstacle courses again, but this time he plays follow-the-leader with another aircraft. The lead plane likes to perform a series of aerobatic stunts, so you quickly become a modern day barnstormer of a sort.

If you like the idea of competing against opponents in the air, you'll probably fall in love with Airplane Racing. This challenge offers the experienced aviator a race against time and five other computer pilots. Once again, the user has a number of different courses to choose from, but he must cross the finish line first in order to win an event. If you like the sound of things so far, the *Advanced Flight Trainer* also contains a software hanger, housing 14 different aircraft for your own personal use.

Jermaine: How did you simulate so many different control panels in a single piece of software?

Lerner: Believe me, it wasn't easy. We solved this major problem by developing a special generic panel, which could be altered to fit the requirements of each panel layout in real life. The FAA requires every plane to have the same basic control panel design. By doing things in this manner, you don't have pilots reading the wrong dial and possibly making a fatal mistake. Speaking of the control system, the compass generated more programming-related problems than any other component of the cockpit.

Jermaine: Throughout this interview, we've talked about the *Advanced Flight Trainer* in general. Can you give me some specific information about the Commodore 64 version of the program?

Lerner: The *AFT* was originally written for the IBM computer, but everyone agreed it would have to be ported over to other systems like the Commodore 64. [Ed. note: the Commodore 64 version began shipping in September 1987.] Future versions of the game will definitely be superior to the parent program for several reasons. First of all, there are certain things we can do on the 64 that can't be accomplished very easily on the IBM system, and vice versa. This difference in the operating systems and the characteristics of the computers themselves, gives us a lot of flexibility in our work. You also have to remember that the basic flight program was written over a year ago. We've learned a lot since then, and that knowledge will be used in the making of future *AFT* translations. The IBM program, for example, featured good graphics and four colors. Our group is currently developing Commodore 64 graphics which not only exhibit a more fluid motion, but also take advantage of an 16-color palette. So you see it's simply a matter of taking the original design, porting it over to a specific system, upgrading the graphics and sounds to match the capabilities of the computer and releasing the finished product to the public.

And now a few words from General Yeager

Continued from pg. 69

Jermaine: How do you feel about the way you were portrayed in the movie, *The Right Stuff*?

General Yeager: You have to look at the film as being good entertainment and not a documentary. I was very pleased, however, with the way things turned out.

Jermaine: When you endorse a product, the public believes that item is superior to others like it. Why have you allowed your name to be added to the title of the *AFT*?

General Yeager: I guess my wife should get credit for that. EA called me and talked to Glennis. She liked their ideas, so we discussed the matter in detail and decided the project would probably be fun. After all, I've been working with flight simulators for a long, long time. Glennis also thought it was a good idea to sort of tie my name in with something I truly believed in. The *Advanced Flight Trainer* fit into this category because it is a high-quality product, with the potential to give the user the thrill of actual flight.

Jermaine: In your career, you have been known to push machines beyond their intended limit. Is there a provision in the *AFT* which allows the consumer to do the same thing?

General Yeager: This is a difficult question to answer. If you push a plane beyond its limit in real life, the pilot usually dies — so you only get to do it once. Follow this same procedure in the *AFT*, and you get a big flash on the screen which says "You're dead." Now this factor in the program isn't very realistic, but it drives home the idea that every airplane has its own limitations and making a mistake at a high rate of speed is usually fatal.

Jermaine: How does microcomputer flight compare with the real thing?

General Yeager: Now I've only worked with one of the microcomputer flight simulators: the *Advanced Flight Trainer*. The graphics are very realistic in the program, but a real pilot will miss the sensations his body experiences during actual flight. When you accelerate, for example, your body is pressed back into the seat by the force of gravity (G force). This same factor also exists when the plane is in a steep climb. Negative G force, which tries to pull you away from your seat, is generated when the pilot dives straight down toward the ground. These natural forces are so precise that some aviators can actually tell if they're doing a stunt correctly, just by the way they feel. The absence of G force in a computer program, however, makes it easier on the human body when you're performing certain aerobatic maneuvers. You don't have to worry about blacking out, but you do need to pay close attention to air speed, your rate of turn, and the data displayed on the G-meter. The *AFT* program also operates at a speed approaching real time. This means that the pilot can respond to a given situation and see the results of his effort almost immediately. I was equally impressed with the simulated air speed of the program. Believe it or not, I can fly one of the computer aircraft at a specific rate of speed and come close to estimating that speed by flying over a building or buzzing an object on the ground.

Jermaine: Inside the *AFT* package is a picture of a broken fortune cookie with the message "Don't screw the pooch." What does this message mean, and why was it important enough to be included?

General Yeager: Many years ago I was flying research aircraft, over the Mohave Desert, with some tactical air force guys. One of their pet expressions was, "Don't

Chuck Yeager

screw the pooch." It means don't auger your airplane into the ground or simply, don't screw up.

Jermaine: Let's discuss a specific airplane that exists in the *AFT*: the Bell X-1. How well is it simulated in the program?

General Yeager: Before I answer that question, I'd like to tell you a little about the Bell X-1. It was a rocket-powered military prototype, created by Bell Aircraft. I used it, back in October of 1947, to break the sound barrier for the first time. The plane had a single seat and was air-launched from a mother ship, with a full load of fuel. As the craft approaches the speed of .9 Mach (Mach 1 or the speed of sound is approximately 739 mph), the airplane exhibits a noticeable stability problem. The nose of the aircraft will suddenly pull up, causing one wing to rise and the airplane turns over. Pilots call this aerobatic stunt a "Dutch roll."

Someone once asked me if it was possible to land the early experimental rocket planes, like the Bell X-1, with a full load of fuel. I told him yes, it was possible, but you blow up. [He laughs for a moment.] That particular aircraft weighed almost three times as much fully fueled. It was air-launched from a mother ship and burned its fuel at a rapid rate, so the landing gear wasn't designed to support a fully-loaded airplane. Some of the NASA pilots (the agency was called the National Committee for Aeronautics back then) actually tried to land the craft with a partial tank of fuel. They succeeded in safely reaching the ground but tore the nose gear off in the process. The correct procedure was to jettison all but a trickle of fuel before landing. Yes, the Bell X-1 has its own set of peculiarities, and you will experience them first-hand in the *Advanced Flight Trainer*.

Jermaine: If you had your life to live over again, are there any events you would modify or do in a completely different way?

Yeager: Now that's a foolish question (he laughs).

In closing I would like to say that Chuck Yeager is a blinding light in a gloomy world, where everyone is searching for something or someone to believe in. Speaking for the software pilots out there, I want to welcome you to our squadron, General Yeager. I'd also like to take this opportunity to thank Charlotte Taylor and Rich Hilleman at Electronic Arts, Randy Havener (my favorite computer pilot), and Scott Taylor for their help with this article. C

Adventure Road

Continued from pg. 62

out all the bikers and mutants in America while playing *Roadwar 2000*, the logical place to go is Europe. As in the original *Roadwar*, your futuristic adventure unfolds in the aftermath of a nuclear war. Instead of leading a crew of knights and dwarves, you'll command convoys of heavily armed cars, trucks and motorcycles and armies made up of street gangsters, the poor and mercenaries. The goal is to find and disarm five nuclear devices, then locate the terrorists' headquarters and annihilate them. Locations of these targets are randomly determined at the outset of each new game.

As with *Eternal Dagger*, *Roadwar Europa* is basically a new scenario that makes few changes to the original game system. You view an overhead map of Europe and its highways, moving a car icon via keyboard commands, until you reach a new town or encounter enemy gangs. Then you can transact with the locals, hoping some will join your forces and fighting others in order to take over the town. A battle can take just as long as in *Dagger*, and again you lose certain capabilities by choosing the "quick combat" option. It's a novice to intermediate-level game, not as hard as *Dagger* or *The Dungeon*.

Sequels have always been a mixed blessing: you know a lot of gamers must have liked the original game, or the company wouldn't have released a sequel. At the same time, few sequels manage to match the excitement and intrigue of the original. In the case of these three, only *Dungeon* clearly outclasses the initial game in the series. That means that if you liked the gaming system of any of these games, you'll have fun with the sequels. But even if you *didn't* like *Alternate Reality, The City*, you might like *Dungeon*. (All are for the 64, though you can expect Amiga conversions of *Dungeon* and *Roadwar Europa*.)

Clues of the Month: In *Dungeon*, a Spirit Shield can be used to attack as well as defend and makes a fine secondary weapon. When your character reaches level three, seek out the Oracle of Wisdom at 27N, 35E on level one. A character in *Eternal Dagger* can carry but three weapons, so give each one a weapon that does Cold, Fire and Holy damage. Back up the character disk before entering Alvis' Tower and before arranging for transportation to the underwater city. These dungeons are one-way affairs, and you'll wind up in a no-win situation if you run out of karma points inside. C

Continued from pg. 76
of still frames have been developed. Next, you instruct *Cell Animator* to play them back in a certain sequence. You can then view the animation, stop it, rearrange it, pause it to edit a picture or any number of things that could normally be done using paper page-flipping techniques.

Gary Schultz, *Dynamic-Cad*'s author, was also present giving full-featured demonstrations of his high-performance Computer Aided Design package. His demonstrations ranged from designs for a simple rabbit hutch to a full-blown fighter jet. He utilized a Roland plotter to demonstrate the wide range of scaling and output functions available and delivered the entire fighter jet drawing reduced to the size of a postcard.

Mimetics

Mimetics' entry in the Commodore booth was a new Genlock device that will fit into your shirt pocket and a 24-bits-per-second Frame Grabber. The Frame Grabber allows you, with the aid of their graphics and control package, to completely control a video environment. For demonstration purposes, they were controlling, and re-editing scenes from a major motion picture. The resolution of the Frame Grabber was such that it was difficult to determine which frames from the movie were being played back from the video tape and which were being displayed from stored, previously grabbed, images.

Their Genlock unit promises a very high-quality output that truly meets the NTSC standard. With the combination of these two products, Mimetics offers video production facilities a chance to perform high-level, computer-aided video production at a fraction of the cost of most systems currently on the market.

Mindware, Inc.

Mindware used their space at the SIGGRAPH booth to introduce their program *PageFlipper*. *PageFlipper* is true to its name — it performs animation by using a page-flipping technique. This involves the creation and manipulation of a separate graphics "page" for each sequence in your planned animation. The package is designed to work with IFF files from any of the major graphics packages, including *DeluxePaint II*, *Images*, DigiView and many others. The system allows you to utilize frames up to the full memory capacity of the machine, in any resolution and number of allowable colors. It also supports full overscan, so you won't be plagued with the borders that are so noticeable in computer graphics.

Of all the packages presented at SIGGRAPH, I found Mindware's *PageFlipper* the easiest to use. By simply drawing a series of frames and doctoring them, you can then put them together and animate the sequence by telling *PageFlipper* the order and speed at which to play them. The finished results can be very humorous or very professional, depending solely on the amount of work you put into the separate frames.

NewTek

Newtek's offerings at SIGGRAPH included demonstrations of DigiView and *DigiPaint*. DigiView has become the de facto standard for capturing images for use with the Amiga. The system's resolution has improved over the past year to a point of extreme clarity. Color selection and sharpness of image have both improved to broadcast quality.

The *DigiPaint* system is the first package for the Amiga that actually takes full advantage of the system's Hold and Modify mode of graphics display. This allows for some very sharp graphics images with the use of the entire palette of 4096 possible colors at the same time. Demonstrations showed the complete colorization of a black and white image that, upon completion of the process, would make you think the image had been captured in color. The process simply involves outlining the area to be colored, selecting the type of colorization, from highly opaque to very subtle tinting, selecting the color to be used and then clicking in the area to be colored. The results were phenomenal and proved to be a real show stopper.

> The user/design interface of *Sculpt 3D* was one of the most intuitive of all of those shown.

In addition to these products, NewTek also demonstrated a playback system that allows you to capture real-time video images and play them back a la Max Headroom. Their presentation was nicknamed "Maxine Headroom," and featured NewTek's own Laura Longfellow in a speech about NewTek and DigiView that consisted of 86 frames. The resulting animated sequence (played back in real time on a standard Amiga 2000) was quite amusing and astounding.

Software Visions, Inc.

Getting away from the strictly graphic nature of most of the software products demonstrated at SIGGRAPH, Software Visions demonstrated their database system *MicroFiche Filer*. *MicroFiche Filer* takes a very different approach to database design and storage techniques. Instead of the standard methods of text storage, *MicroFiche Filer* uses a technique similar to that used in the micro-fiche industry, hence its name. Your records, whether pictures or pages of text stored as pictures, are stored in a micro-fiche style page, which you would scan by sliding a "magnifying glass" over the reduced images, selecting the page of interest and then viewing or printing it.

MicroFiche Filer offers the same features found in most text-oriented databases — searching, reporting and printing, but offers them with a much simpler method of operation. It allows you to store pictures of any size, display several pictures at once (limited only by available memory) and mix pictures with text.

University of Lowell (Zoxso)

For those of you who have been involved with the Amiga from the early days, you may remember Zoxso as the company promising a CLI replacement called "ZLI." Due to problems with changing from software version 1.0 to 1.1 and then on to 1.2, Rich Miner and his crew scrapped the ZLI project and went into the nether realms of Amiga hardware. The result is a 35 MIPS (million instruction per second) digital processing card. The speed of this board, which is better than that required by true video throughput, allows for image applications on the Amiga 2000 that were never dreamt about by most people in the early stages of the Amiga's development.

The board uses a DMA (Direct Memory Access) interface that will provide its user with the ability to perform very high-speed image processing for animation and other graphics-oriented tasks.

Winner's Circle System

Winner's Circle has produced a turnkey graphics development and presentation system based on the Amiga series, utilizing several software packages on the market (including Aegis' *VideoScape 3D*). The system is designed with the average user in mind, which meant mainly bringing the cost for such a system to below the $10,000 price range. Thanks to the price of the Amiga and various newly developed large screen projection systems, Winner's Circle is

able to provide systems starting at well below $10,000.

This brings the cost of graphics/video production/presentation systems well within the reach of everyone from schools to corporations who weren't thrilled with the idea of investing large sums of money to be limited to a single system. Now these people can afford to purchase multiple systems making it easier for a multi-department company or school to do the same work in a more efficient manner.

Professional Page goes the extra mile and gives the user the ability to use color separation techniques for the creation of "magazine-quality color documents."

In addition to providing the system to users, Winner's Circle is also going to produce video advertising and presentations themselves. Pricing promises to be much lower than that charged by a traditional production studio.

In addition to the turnkey system, Winner's Circle will also be going head to head with CSA with the introduction of a 68020/68881 processor replacement board for all Amigas. The 500 and 1000 units will be piggyback style while the 2000 version is designed to use the CPU slot provided.

Hits of the Show

Of the various items demonstrated at the SIGGRAPH convention, I found two particular lines of special interest. I'm not trying to say that the other items presented were of less importance, but the items I selected were the kind of items that I feel will help push the Amiga family into the limelight where it should have been all along. These items are the Computer Systems Associates (CSA) Turbo Amiga product line and the Ameristar Network cards.

First, let's take a look at the CSA products and describe what they will do for current Amiga 1000 owners as well as what they will do for people considering buying an Amiga 500 or 2000.

CSA's major release for the Amiga 1000 is the Model TH1000 Turbo Highrise Expansion Chassis. This chassis (formerly called the "Tower") will allow current Amiga 1000 owners to upgrade their machines to full slot compatibility with the Amiga 2000. The Turbo Highrise contains seven "Zorro" slots, four IBM-compatible slots and a CPU slot. With a suggested retail of $995.00, it will probably be welcomed by 1000 owners looking to upgrade. Now instead of trading in or selling your Amiga 1000, you can add the Highrise for less than the replacement cost required to move up to the capabilities of the 2000. The Highrise will then allow an Amiga 1000 owner to take full advantage of products designed to work with the Amiga 2000.

CSA is also marketing a wide range of products for use in the Highrise or inside an Amiga 2000. Included are a 68020/68881 Turbo card, 32-bit Static RAM in 1/2 MB and 2 MB sizes, a SCSI controller and various SCSI-compatible hard drives. In addition they are also producing a unit that will allow you to install a 68020, 68881 and 512K of 32-bit Static RAM inside an Amiga 1000 by simply removing the existing 68000 MPU and plugging a piggyback board into the 68000 socket. Prices for these items are $595 for the 68020, $895 for the 68020/12MHz 68881, $1,295 for the 68020/20MHz 68881 and an additional $795 for 512K of 32-bit Static RAM with any of these configurations.

NewTek also demonstrated a playback system that allows you to capture real-time video images and play them back a la Max Headroom.

If you have an Amiga 500 and would like to add the speed and performance of the 68020/68881 to your machine, CSA also produces versions of the piggyback unit for you. The prices are the same as for the Amiga 1000, but the 512K of Static RAM is not an available option. CSA is also planning to produce a mini-rack unit for the 500 that will allow you to use some of the cards designed for the 2000. Exact specs were not available at SIGGRAPH.

In any case, the Turbo line promises that, whichever Amiga you own, your performance will be greater than any of the industry's performance leaders'. In fact, an Amiga 1000 with the Turbo Highrise, 68020/68881 processing pair and 512K of Static RAM turns in a Dhrystone figure of 2250, whereas a VAX 11/780 turns in a Dhrystone figure of 1500. This makes the Turbo-ized Amiga 50% faster than a VAX.

Richard Moore and Joe Simoneti, of Ameristar, were busy showing off what many in the computer industry consider necessary for a serious computer to survive — networking. Richard and Joe, along with the other members of Ameristar have produced a networking system for the Amiga series that gives an Amiga owner the capability to network his or her machine to other Amigas or other system servers (like SUN or DEC machines) via either the Ethernet or Arcnet protocols. I spoke with Joe and Richard to find out more about the protocols involved and to get their reasoning behind bringing networking to the Amiga family.

When asked "Why the Amiga?" Joe responded that they saw the Amiga as a machine that had a lot of potential. They felt that they could enhance the usefulness of the machine by introducing network services. At the time, they had seen SUN's network file system (NFS) as an emerging industry standard and felt that they could bring the Amiga into the mainline of the industry by producing Ethernet and Arcnet boards to support this standard. In doing so, they've made the Amiga available for use as a low-cost client workstation.

They have also supplied peer to peer capabilities that will allow you to assign an Amiga as the server and then have a number (limited only by the protocol you are using) of other Amigas acting as workstations. Each workstation can have its own local file system, however, it can rely entirely on the server if it must. Also, you would not be limited to a single-server-multiple-client system. With the drivers provided, any Amiga on the network can be set up to act as the server for any other Amiga, while actually being the client of yet another Amiga (or other host, for that matter). Therefore, given four Amigas, A could be a server for B, C & D, while C was also a server for D & A, with B acting as a client for a SUN out further in the network.

The boards sell for $495 each in the Amiga 2000 configuration. The driver software is almost invisible to the user — in fact, when Joe demonstrated the system hooked up between a SUN Series 3 and an Amiga 2000, the SUN (which was the server) showed up on the Amiga screen as just another Workbench disk icon. Also, when accessed, the speed in which the network responded

was actually much faster than the usual Amiga disk response. So far as the Amiga was concerned, the SUN was just another volume that it had access to. One difference to the Amiga's devices, however, was that the server could be unmounted while an Amiga device, once mounted, is there until you reboot your machine.

Joe was quick to contribute the following comment: "The *best* networking is networking that you don't see. The *best* networking is the kind where you can use the copy command or run your favorite editor or do everything as if the network was a disk on your own machine. You don't want to have a lot of special commands just to use the network, you want to make the whole thing transparent to the user."

Richard summed up their work by saying, "There are certain areas of development that people have moved into. We feel that we've opened up an avenue into a whole new area of development. People can get on board and develop multi-user applications that were unheard of before."

In addition to their separate interests, CSA and Ameristar have gotten together and CSA will be marketing the Ameristar Networking cards and drivers with their Turbo-Amiga line to combine the functionality provided by these products.

With companies like CSA and Ameristar developing products for our machines, Amiga owners may soon be able to look back at the early skepticism and laugh, knowing that it was only a matter of time before we got the last laugh. C

Included in the Commodore booth were exhibits by:

Aegis Development
2210 Wilshire Blvd., Suite 277
Santa Monica, CA 90403
(213) 392-9972

Ameristar Technologies
P.O. Box 415
Hauppage, NY 11788
(516) 698-0834

Anakin Research
100 Westmore Drive
Unit 11C
Rexdale, Ontario M9V 5C3
Canada
(416) 744-4246

Associated Computer Services
1306 East Sunshine
Springfield, MO 65804
(417) 887-7373

Byte by Byte
Arboretum Plaza II
9442 Capital of Texas Highway N.
Suite 150
Austin, TX 78759
(512) 343-4357

CalComp
2411 West La Palma Ave.
Anaheim, CA 92803
(714) 821-2000

Computer System Associates (CSA)
7564 Trade St.
San Diego, CA 92121
(619) 566-3911

Gold Disk, Inc.
P.O. Box 789
2171 Dunwin Dr., #13
Mississauga Ontario L5L 1X2
Canada
(416) 828-0913

Liquid Light
2301 West 205th St.
Suite 106
Torrance, CA 90501
(213) 618-0274

MicroIllusions
17408 Chatsworth St.
Granada Hills, CA 91344
(818) 360-3715

Mimetics
P.O. Box 1560
Cupertino, CA 95014
(408) 741-0117

Mindware, Inc.
370 Dunlop St. W.
Unit 35
Barrie, Ontario L4N 5R7
Canada
(705) 737-5998

NewTek, Inc.
115 West Crane St.
Topeka, KS 66603
(913) 354-1146

Software Visions, Inc.
26 Forest Rd.
Framingham, MA 01701
(617) 877-1266

University of Lowell (ZOXSO)
P.O. Box 283
Lowell, MA 01853-0283
(617) 655-9548

Winner's Circle System
2618 Telegraph Ave.
Berkley, CA 94704
(415) 845-4811

Continued from pg. 18

RAM:C assumes that I want to work from the Workbench only. The only drawback to using a RAM:C configuration is the slowdown in the booting process and the loss of approximately 199K of RAM.

[You could edit the COPY portion to include only the files that you use if you don't need the entire C directory - taj]
Frank Dean
Brunswick, ME

Defender of the Crown: When laying siege on a castle, you must be careful not to use up all of your ammunition before you completely breach the castle wall. To increase the accuracy of your shots, here are some hints that will help you break through with the least number of shots:

Your first shot should be made with the cradle of the catapult (the part that the rock sits in) positioned so that five to six pixels of the rope are exposed. Each shot after that should allow one more pixel of the rope to be exposed. If you follow this guide you should be able to breach the wall with ammo to spare.

Another interesting thing that I have discovered is that if your home castle is attacked, and you have no men there, the computer will put a number of men equal to your campaign army in your castle. For example, you have zero men at home and 50 men in your campaign army and your home castle is attacked. You will now have 50 men at home and 50 men in your campaign army. If you win the battle at home, you can return and put these 50 additional men into your campaign army.
Greg Nichols
Penn Valley, CA

Sinbad and the Throne of the Falcon: If you are tired of being wiped out every time you get into shipwreck territory or killed when you have to do battle, here's a small tip that will save you some anguish (and lives): By double-clicking on the Close Gadget in the upper left hand corner of the screen, you will be taken to GAME UTILITIES. Once there, you click on the RESUME GAME Gadget which will return you to the World Map screen. You may now continue to explore. Also, if you are ready to end the game by fighting the Black Prince in the battle to the death at the castle, do this before you actually fight, and both of your strengths will be returned to full. That doesn't make it any easier to defeat him, but it may keep you live a bit longer.
Tim Park
Ottawa, Ontario Canada

Stack Information: If you're the kind of person who uses the CLI and then "RUNs" all of your applications from the current CLI, here's a bit of information that may enable you to do more with your Amiga than you could before. In many instances, programs require as little as 2K of Stack memory to operate. In others, they require as much as 50K. The first thought many of the users in my circle had was that you must set the Stack to the largest configuration required to prevent any problems when you run those stack-intensive applications. This was due to the fact that whenever you "spawn" a new task from an existing CLI using RUN, the program will be started with a stack the size of

Continued on pg. 116

Faery Tale Adventure

Continued from pg. 38

of doors, and each key is only good for one door opening.

There are some problems with *Faery Tale Adventure*. First, there are actually two different versions of the game. There is a second version because there were many bugs and problems with the first version. The old version of *Faery Tale Adventure* can corrupt any saved game, possibly prohibiting you from loading your saved game. More often it will mean that objects and people will appear in your saved game where they aren't supposed to be. If you do find out that you have bought the old version of *Faery Tale Adventure*, do not despair. Send your original disk to MicroIllusions, and they will send you the new version. If you are not sure which version you have, save a game in progress, and watch what happens next. If the screen does not change, then you have the new version. However, if the *Faery Tale* screen disappears, and is replaced by a black screen which only contains the familiar CLI prompt, then you have the old version of the game. There are still a few bugs in *Faery Tale Adventure* that haven't been fixed yet. For example, the game does not work with all expansion memory devices. Also, at various times the people and monsters in *Faery Tale* will appear as "colorful garbage."

As for problems with the game other than the programming, one problem is that you can't carry extra food with you. There are pieces of food that can be found, picked up and later eaten, but these random morsels appear rarely. Since a tremendous amount of traveling must be undertaken, you constantly find your character on the brink of starvation. Another flaw is the length of time that must be spent traveling from place to place. I don't object to the size of playing field, rather I am frustrated with the lack of interesting places to check out on this land mass.

Overall, I was very pleased with *Faery Tale Adventure*. Unlike a game like *Defender of the Crown*, where the audio/visual parts of the program are intended to dazzle and awe, the effect of the audio/visual parts of *Faery Tale* is much less noticeable. *Faery Tale* does not have the best graphics, sound or animation of all Amiga games, but the combined effect of all three is matched by perhaps no other game on the Amiga market today. I strongly suggest that you take a look at *Faery Tale* for yourself, and see what I mean. Despite the problems that still exist with this game, I'm sure that you will feel that you will be getting your money's worth. ■

AMIGA Software Reviews/Barbarian

Continued from pg. 40

where you began. If you delay, the volcano erupts with you in it.

The game has a funny side as well. Hegor may be a hero, but his IQ isn't anything to brag about. He will follow your instructions to the letter, regardless of how foolish they may be. For instance, if you tell him to walk off the edge of a cliff, he will without hesitation. (A character asked to do an obviously deadly feat in an adventure normally points out the stupidity of the action and refuses.)

Barbarian is a first-rate Amiga title from Psygnosis, a Liverpool-based company, and after experiencing the game's quality and challenge I hope many more will follow. If you are looking for a beautiful, addictive, action-packed challenge for your Amiga, this one will do just fine.

Hints

The only sure way to succeed is to memorize every step through the cavern. Here are some suggestions to get you started:

- When Hegor first begins walking you can cause him to both thrust his sword and walk at the same time. This combination is great for the first two opponents since they time their attack with Hegor's hesitation. If you start and then stop him, getting him to both walk and thrust again is difficult, and sometimes deadly.
- Since time is a factor, and at least on the first few levels of the catacombs Hegor is quicker than Necron's guards, combining running and fighting will get you where you are going faster with less risk.
- Fighting isn't always the answer—Hegor can jump better than Carl Lewis. Use this move to get behind opponents who give you real trouble. For instance the only way to get past the first twin trees is to jump through before the trap falls. The same is true of the wooden bridge—you can't walk across it, but you can jump over it.
- If you think the way Hegor jumps forward is good, you need to see him jump backward. This is a great maneuver to position yourself behind an opponent and land facing his back. To do this turn Hegor's back to the advancing threat and then click the defend icon. This causes the little barbarian to do a flying reverse jump. As soon as he lands, go into attack posture and the bad guys won't know what hit them.
- Hegor performs commands in sequence. So if you want him to walk right and then thrust you can issue the orders rapidly. This is helpful when you need to avoid a threat off screen. ■

Continued from pg. 114

your current stack default. If this default is 25000 bytes, then you throw away an extra 25K every time you start a new application (no matter how small). One way around this is by issuing a NEWCLI command from the current CLI, resize the new CLI window to its smallest size and then adjust the stack size in that window to what is necessary for your application. Now, you are only using the memory required for the mini-CLI, the application and its stack. This doesn't disturb the original stack size, however. In many instances, this could mean the difference between two and three applications running in the multitasking environment awarded by the Amiga. Also, some applications create their own stack through calls to AllocMem in the Exec Library. If this is the case, then your savings could actually be greater than expected.

These charts demonstrate the saving on my machine (512K for this example).

Original CLI with a Stack of 10,000 Bytes. Full Screen

Type	Available	In-Use	Maximum	Largest
chip	364824	151040	515864	187712
fast	0	0	0	0
total	364824	151040	515864	187712

Secondary CLI with Stack of 4,000 Bytes. Minimum Size

Type	Available	In-Use	Maximum	Largest
chip	370824	145040	515864	187712
fast	0	0	0	0
total	370824	145040	515864	187712

Original CLI w/10K Stack and UE in 2nd CLI

Type	Available	In-Use	Maximum	Largest
chip	224640	291224	515864	175712
fast	0	0	0	0
total	224640	291224	515864	175712

Secondary Mini-CLI w/10K Stack and UE

Type	Available	In-Use	Maximum	Largest
chip	224640	291224	515864	175712
fast	0	0	0	0
total	224640	291224	515864	175712

Secondary Mini-CLI w/2K Stack and UE

Type	Available	In-Use	Maximum	Largest
chip	240432	275432	515864	187712
fast	0	0	0	0
total	240432	275432	515864	187712

The first two charts show the difference with blank CLI windows, while the last three show the difference between a 10K Stack initial window and the effects of reducing the Stack to 2K in the second CLI prior to running the Shareware editor, UEdit.

Arlen Stephens
St. Louis, OH

A Better LINE INPUT for AmigaBASIC: This is a fix to the screen flash that occurs when you use LINE INPUT or INPUT$ with the AC/BASIC compiler from AbSoft. It also allows you to specify the number of characters to accept and where on the screen to display the response. Also, Backspacing will only go as far as the first character that the user has entered. To use it, call it by passing the number of characters allowed by the user in response and the X and Y locations on the screen. The examples will demonstrate how to do this. The user's response will be returned in the shared variable User$. It is assumed that you have preset the color that you want the text to be displayed in prior to calling Response.

```
CLS : DIM Test$(2)
LOCATE 23,1 : PRINT "What is your name?";
CALL Response(20,23,20) ' Or Response 20,23,20
Test$(0) = User$
LOCATE 12,5 : PRINT "How old are you?"
COLOR 3
CALL Response(3,12,22)
COLOR 1 Test$(1) = User$
LOCATE 1,1 : PRINT "What do you think of this SUB Pro-
gram?"
CALL Response(78,3,1)
Test$(2) = User$

LOCATE 6,1 :
PRINT Test$(0),Test$(1),Test$(2)
END

SUB Response(Num%,yLoc%,xLoc%) STATIC
SHARED User$

  LOCATE yLoc%,xLoc%
  CursY = (yLoc%-1)*8
  CursX = (xLoc%-1)*8
  LINE(CursX,CursY)-(CursX+6,CursY+7),3,bf
  User$ = ""

GetEntry:

  c$ = INKEY$ : IF c$ = "" THEN GOTO GetEntry
  IF ASC(c$) = 13 THEN
    LINE(CursX,CursY)-(CursX+6,CursY+7),0,bf
    EXIT SUB
  END IF
  IF ASC(c$) = 8 AND LEN(User$) > 0 THEN
    User$ = LEFT$(User$,LEN(User$)-1)
    PRINT c$;
    LINE(CursX,CursY)-(CursX+6,CursY+7),0,bf
    CursX = CursX - 8
    LINE(CursX,CursY)-(CursX+6,CursY+7),3,bf
    GOTO GetEntry
  ELSEIF ASC(c$) = 8 AND LEN(User$) = 0 THEN
    GOTO GetEntry
  END IF
  IF LEN(User$) = Num% THEN BEEP : GOTO GetEntry
  LINE(CursX,CursY)-(CursX+6,CursY+7),0,bf
  CursX = CursX + 8
  LINE(CursX,CursY)-(CursX+6,CursY+7),3,bf
  PRINT c$; : User$ = User$ + c$
  GOTO GetEntry

END SUB
```

This one will run as it'is. Just be sure to pass the values described and you can now have better control of user input in your programs.

Tim Jones
Deltona, FL

Amiga Software Reviews/Online 2.0

Continued from pg. 46

MicroSystems now claims that *Online!* can keep up with 9600 baud. Although I can't confirm this, I can tell you that 2400 baud is no longer a problem for *Online!*'s screen I/O routines.

Many new commands have been added to the script file capabilities in *Online!* One is the Menu command, which allows you to simulate moving the mouse and selecting a menu option. Another new script command is Say, which allows you to actually say the line, via the Amiga's built-in speech capability. You can now effectively create script subroutines, and keep the subroutines separate from the main script file via the Do command. Do will allow you to execute another script file, then return you to the main script file.

There are now a set of little gadgets, located at the bottom of the window, which allow you to execute macros (shifted and unshifted) without taking your hands off the mouse. *Online!* now has a review mode which will store the last 8K of screen text, so you can review this buffer at any time. You can save the buffer, print it, or perform cut and paste to and from the clipboard, which will allow you to transfer data to and from any other Amiga program that is running to and from *Online!*'s review buffer.

Online! still has a few problems. Menu and sub-menu options don't seem to be grouped in any sensible pattern. For instance, putting the Duplex menu option separate from the baud rate and parity settings makes little sense. Another problem that still hasn't been fixed for good is *Online!*'s infamous bug—the screen's text display can be thrown into the graphics (or international portion for the Amiga's jewel fonts) portion of a font's ASCII map. *Online!* used to occasionaly start showing strange text characters, effectively ruining any terminal session. This happens less frequently with *Online! 2.0*, but it still can occur. If it does, you are forced to quit *Online!* and start all over again.

Another small complaint I have is that while *Online!* still supports CIS-B, CompuServe's special protocol, they have not added WXmodem to their available protocols. WXmodem is PeopleLink's special protocol, and there are very many Amiga users on PeopleLink.

Despite these problems, *Online!* has re-emerged as a good terminal program. While it will face stiff competition, *Online!* now has what it takes to at least deserve serious consideration for any Amiga user who is looking for a good terminal program. C

Inside Q-Link

Continued from pg. 64

magazine to provide copies of their programs online. These program files are being provided as a special convenience and this should not be taken as an indication that the programs are being placed in the public domain. Files of this type are usually segregated from the Public Domain libraries.

One other type of file you'll occasionally find online are the shareware programs. These are also copyrighted programs, but you can copy and distribute them freely. The authors request, however, that you send some sort of monetary donation to support future efforts if you find their creations useful. You can normally find out how to contact them within the program itself, along with specific information on what type of donation is expected.

A donation typically registers you as a user with the author and may get you detailed printed documentation, future updates, or supplementary programs or utilities. Some shareware authors abuse this concept, however, by issuing numerous "updates" that may attempt to milk users for additional income. Use your head and try to support those authors you find helpful and the products you like. If an author sees a worthwhile return for his efforts he'll be encouraged to work on new and better products.

Many shareware authors have not fared so well in the past, so an association has been formed specifically for them. If you're considering distributing a program you've written via this method, it might be wise to contact the Association of Shareware Professionals (ASP) at 11058 Main St, Suite 225, Bellevue, WA 98006.

Here's one final hint that many novice users may find helpful. If you remember these two simple lines, you should never get lost:

When in doubt—Use F5
When all else fails—Use F7

These simple rules never seem to dawn on users and are very easy to remember. They work almost anywhere on the Q-Link system. F5 always gets you out of whatever area or function you're in. If that fails, F7 will do just as well or provide more information on what to do next. If you're totally and hopelessly lost and don't know what to do next, there's always the power switch on your computer!

As usual, I can be reached online almost daily via E-Mail addressed to RBAKER if you have any comments, questions, or hints you'd like to share with fellow users. C

Continued from pg. 73

Creative Services puts together the InvisiClue booklet that is made for each game.

Meanwhile, the testers are making sure that the game in production is error-free and as good as the imp can make it. The majority of the testing phase is spent checking bugs and rechecking old bugs. It gets very tiring to play the same game again and again, so Product Testing Manager Liz Cyr-Jones tries to space out the testers so that they don't get burned out on a game. Cyr-Jones describes Testing: "There are a ton of meetings involved and at some point in the process a day may go by where three new versions of the same game are tested, fixed for bugs and retested. It's very handy to have the designers right down the hall."

The original team of four spent many sleepless nights creating the Great Underground Empire.

After Testing and Creative Services are finished, the product is almost ready. Getting the product to market now lies in the hands of Marketing and Sales. Director of Marketing Mike Dornbrook, Product Manager Gayle Syska and Sales Development Manager Gabrielle Accardi each have a few weeks with the product to do their jobs. Public Relations Manager Cynthia Weiss also has a few weeks to send out press releases and review copies to reviewers on her list. Ironically, advertising has been cut back and Infocom relies heavily on the work of these three people to promote the product.

Distribution of a new product throughout the U.S., Canada, Europe, Japan and Australia is handled by Activision. Infocom, a wholly-owned subsidiary of Activision, retains full creative control over products under the Infocom label. Director of Marketing Dornbrook said "Activision is there to help us with different things we may need. Activision offers us many more possibilities, including an Amiga version of *The Lurking Horror* that includes sound effects."

To put an interactive fiction program onto disk for consumer use, the imps use a language created especially for the design of interactive fiction called ZIL (Zork Implementation Language). Chris Reeve, Vice President of Product Development, describes ZIL: "It's similar to the computer science language Pascal in that a command entered in the game calls a procedure, and that procedure calls other procedures in a long chain to check all of the possibilities. Eventually, the chain ends and the command can be processed. Programming in ZIL with new commands requires linking the new commands to the appropriate procedures. ZIL is symbolic, like LISP, and checks the relationships between an object and an action to see if it feasible."

An imp designs the game on a mainframe DEC 20 system, lovingly known as "Fred." After using ZIL to get the code together for the game, the program is converted to the various microcomputers. Because the conversion to different micros occurs after the main code is written, all versions are essentially written at the same time. The original machine language (called Z-machine language) is placed on the micro's disk along with a ZIP (Z-machine Interpreter Program) that understands the original machine language and adapts it to the micro. Brian Moriarty, designer of the new release *Beyond Zork,* attempted to use advanced EZIPs (enhanced ZIPs) to produce unique features for his game.

While developing *Beyond Zork,* Brian asked "What could be done to make all of the typing and mapping easier for the player?" The result is found in *Beyond Zork,* complete with many new enhancements. The game draws a map on the screen as you visit locations. It also allows the player to use a mouse to point at the map to move along. You can also program the function keys to execute a string of commands. These enhancements will make *Beyond Zork* very popular in the market to those looking for a little extra with their Infocom game.

The Status Line

For 250,000 readers, *The Status Line* is the major source of news about Infocom. Since 1982, there has been a newsletter for the fans of Infocom. Originally started by Director of Marketing Mike Dornbrook as a newsletter for *Zork* fans called *The New Zork Times, The Status Line/The New Zork Times* has seen publication 18 times as of this writing. What makes *The Status Line* so popular?

Perhaps the fact that the newsletter is free for all purchasers of an Infocom game helps the circulation of *The Status Line.* By filling in the warranty card that comes with every game, you are eligible to receive *The Status Line.* No renewal is necessary for you to receive the most up-to-date information about Infocom and its games. The newsletter is published four times a year and has grown larger every year of publication.

The New Zork Times was first published in 1982 under the direction of Mike Dornbrook, who coincidentally also founded the *Zork* Users Group, ZUG. In 1986, a famous New York newspaper requested that Infocom change the name of the newsletter. One issue went by without a new name. Finally, a reader's suggestion was accepted in a contest and the name of the newsletter was officially changed to *The Status Line.* However, true fans of Infocom still refer to the newsletter as *The New Zork Times.*

The New Zork Times offered subscribers special *Zork* merchandise that, alas, is no longer available. When Infocom took over *NZT* from ZUG, the special merchandise did not switch hands. So, if you can find any of the original *Zork* buttons, bumper stickers, hint booklets and posters, you have bona fide collector's items. Still, *The Status Line* continues the tradition of those four early editions of *NZT* and offers some special deals of its own.

Subscribers are eligible to take part in the contests that appear in *The Status Line,* of which there are usually two per issue. Also, readers of the newsletter occasionally get special offers for Infocom merchandise and discounts on games. For example, all 18 issues of *The Status Line/ The New Zork Times* were offered for $10 in the Summer 1987 issue of *The Status Line.* Similar items are occasionally offered for sale. In the Winter 1986 edition of the newsletter (then *The New Zork Times),* the first 150 purchasers of *Ballyhoo* for each computer version received editions signed and numbered by Jeff O'Neill.

I find the most interesting part of each edition of *The Status Line* is the puzzle that appears in the back. Each puzzle really has two parts. First, the reader must answer trivia questions about the Infocom games. These questions can ask for number answers or word answers and are usually difficult and obscure. In any case, after answering these questions, the results are placed into some other kind of puzzle, requiring correct answers from the first part and an ability to solve the second puzzle. Previous puzzles have included crosswords, connect the dots, anagrams and guessing what game a particular name comes from.

I had the pleasure of playing *Beyond Zork* during my trip to Infocom. Although it wasn't complete, I can already say that the game will be one of my favorites of the year. *Beyond Zork,* aside from all of the normal elements and those discussed by Moriarty above, is partly a role-playing game in that your character has distinct characteristic ratings that increase throughout the game. Moriarty described *Beyond Zork:* "It's not a sequel and it's not a prequel. It takes place in the universe of the *Zork* trilogy, the *Enchanter* trilogy and *Wishbringer* and has elements from all those games."

New directions that Infocom has taken are evident in two games released in September. *Plundered Hearts,* designed by newest imp (and first female game designer) Amy Briggs, is the first interactive fiction game from Infocom with a female protagonist. Briggs describes *Plundered Hearts* as a "pirate romance. You're a woman traveling in the Caribbean in the late 1600's and you get caught up with pirates. It's not a silly romance story that has women swooning everywhere, but more serious and lifelike."

Nord and Bert Couldn't Make Head Or Tail Of It is the other recent release. *Nord and Bert,* designed by Jeff O'Neill, is a set of eight short stories that deals with word games. The short story format and the on-line InvisiClues are unique to *Nord and Bert.* On-line InvisiClues can be accessed with a special command and require the player to "peel off" the answer to a question to select the level of help wanted — a general push in the right direction or a revelation of the full answer. Jon Palace, Creative Development Manager, remarked, "We're not promising on-line InvisiClues with all future games. It's an experiment. Just like the enhancements made in *Beyond Zork.*"

Infocom hopes to collaborate with many authors to design games. Douglas Adams has had two successes with Infocom's *The Hitchhiker's Guide to the Galaxy* (co-authored with Steve Meretzky) and *Bureaucracy.* The company would like to see collaborations with other authors for game designers. Look for more news in this area soon.

Other big news from Cambridge is the return of Marc Blank, *Zork* trilogy co-author, to design a spy game. The game will have three segments, one of which will take place in real time, so that if you take

Other big news from Cambridge is the return of Marc Blank, *Zork* trilogy co-author, to design a spy game. *Border Zone* will have three segments, all of which take place in real time, so that if you take your time playing the game, you'll waste valuable game time. Blank has been away from Infocom for a few years but the veteran designer has been working on his new project for some time. *Border Zone* should be available by the time you read this.

The success that Infocom enjoyed last year was considerable. Public Relations Manager Cynthia Weiss related proudly, "All of our titles released this year made it to the Softsel Hot list. The games that were named to the list were *Bureaucracy, Hollywood Hijinx, Stationfall* and *The Lurking Horror.* Also, last quarter we saw the first profit since December 1983.

Obviously, the company would not be as successful if it weren't for the talented innovators who form the backbone of Infocom. Their interactive fiction keeps people up late, home from work and hopelessly addicted until completion. I annually replay the *Zork* trilogy just like other people re-read certain books. The humor, creativity and intellectual challenges contained in each game expand the imagination. After meeting the people at Infocom, I can no longer regard a new game as merely a box with a disk and enclosures. Instead I see the hard work and dedication that goes into every game, from the Customer Support reps who replace disks and answer endless questions to Testing who look for the best in a game, extending to all areas of the company.

Carl Genatossio described it best: "It's a mix of top quality people working here — the game writers, the marketing people, the creative people, the production people, the testers, public relations and customer support. Everybody is really top-notch here, and it's just a wonderful working relationship."

I would like to personally thank Cynthia Weiss, without whom this article could not have been written. Her hard work is well-appreciated. ■

Infocom Trivia

Here are some interesting bits of information about Infocom that I discovered while conducting research for this article:

- Steve Meretzky designs all of the puzzles for *The Status Line/The New Zork Times.* In his search for the most obscure pieces of information, he sometimes finds things the imps didn't know about in their own games. The Zorkmid coin pictured on the back of the *Zork I* box was never included in the game package or mentioned in the caption for the photograph. It took until *Zork Trilogy* for the coin to surface in an Infocom game.
- Steve is considered the most prolific of the imps at Infocom. If not working on a new game or proposals for a game, Steve thinks up nasty new puzzles to unleash on *The Status Line* readers.
- In the photo session for the *Spellbreaker* booklet cover, the man playing the wizard fell asleep during makeup, only to wake up with a full beard added to his head.
- If you examine the wizard's hands in the *Spellbreaker* photos, you'll notice that he is wearing Dave Lebling's class ring from M.I.T., the "brass rat."
- Jeff O'Neill, in the process of researching his first game, *Ballyhoo,* turned in receipts for a circus ticket, parking, circus program, four snow cones, six hot dogs, a babysitter for four hours and lost time from work for five hours. Needless to say, his research paid off well with the success of *Ballyhoo.*
- Being a tester at Infocom reaps its benefits. Director of Marketing Mike Dornbrook was the company's first tester. Imps Steve Meretzky, Amy Briggs and Jeff O'Neill all started out as testers with the company too.
- Brian Moriarty, designer of *Wishbringer, Trinity* and *Beyond Zork* is a former editor for *ANALOG Computing* magazine.
- Steve Meretzky originally hated text games. As Mike Dornbrook's roommate in college, he was slowly drawn into the games and before long was designing them himself.
- Jim Lawrence, co-author of *Seastalker* and *Moonmist* with Stu Galley, wrote for the Tom Swift, Jr., Bobbsey Twins, Nancy Drew and Hardy Boys series.
- Michael Berlyn, aside from his efforts in designing *Infidel* and *Suspended,* was the designer of a game called *Cyborg* and the author of *Crystal Phoenix* and *The Integrated Man.*
- Finally, the word "Zork." Everyone asks where it came from. The real story is that Marc Blank, one of the original designers of *Zork* and Infocom veteran, chose the name for the game that he and Dave Lebling, Tim Anderson, Joel Berez and Bruce Daniels created. "Zork" was a popular nonsense word at the M.I.T. Laboratory for Computer Science used as an interjection when something went wrong. If only Marc could have know the impact that word would have on the software industry and adventure games. ■

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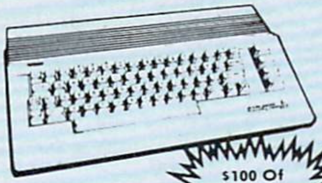
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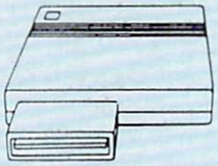
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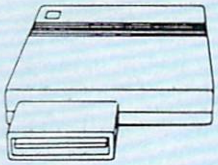
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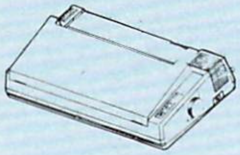
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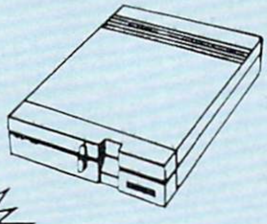
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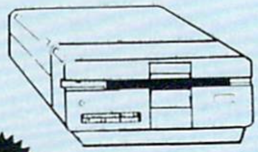
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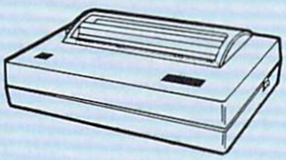
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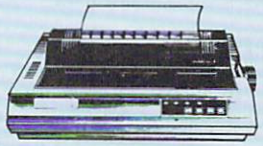
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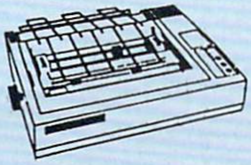
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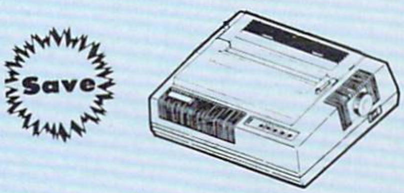
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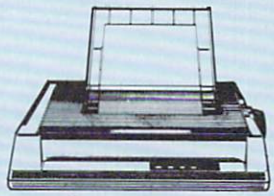
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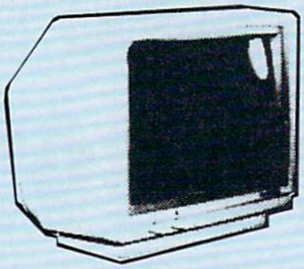
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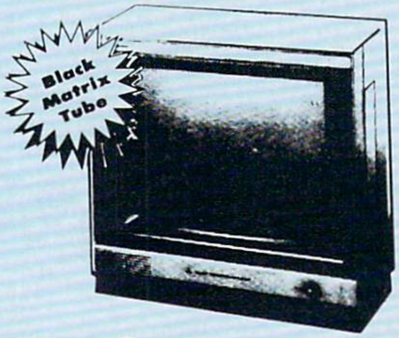
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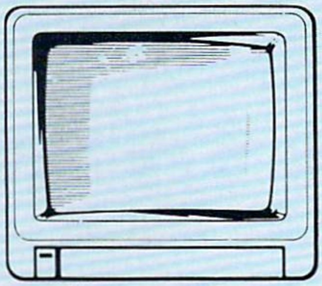
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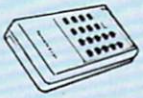


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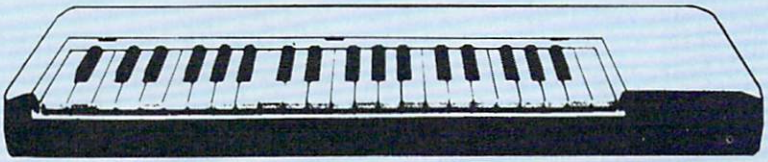
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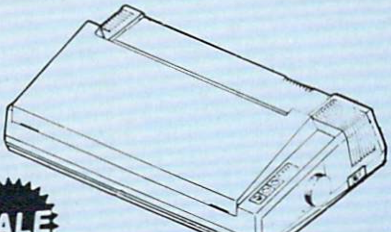
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The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME
"[CLEAR]" = SHIFTED CLR/HOME
"[DOWN]" = CURSOR DOWN
"[UP]" = CURSOR UP
"[RIGHT]" = CURSOR RIGHT
"[LEFT]" = CURSOR LEFT
"[RVS]" = CONTROL 9
"[RVOFF]" = CONTROL 0
"[BLACK]" = CONTROL 1
"[WHITE]" = CONTROL 2
"[RED]" = CONTROL 3
"[CYAN]" = CONTROL 4
"[PURPLE]" = CONTROL 5
"[GREEN]" = CONTROL 6
"[BLUE]" = CONTROL 7
"[YELLOW]" = CONTROL 8
"[ORANGE]" = COMMODORE 1
"[BROWN]" = COMMODORE 2
"[L. RED]" = COMMODORE 3
"[GRAY1]" = COMMODORE 4
"[GRAY2]" = COMMODORE 5
"[L. GREEN]" = COMMODORE 6
"[L. BLUE]" = COMMODORE 7
"[GRAY3]" = COMMODORE 8
"[F1]" = F1
"[F2]" = F2
"[F3]" = F3
"[F4]" = F4
"[F5]" = F5
"[F6]" = F6
"[F7]" = F7
"[F8]" = F8
"[POUND]" = ENGLISH POUND
"[SHFT ^]" = PI SYMBOL
"[^]" = UP ARROW

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. .) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>59382 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

Continued from pg. 104

fact you'll be back in conference mode, where you can chat to your heart's content. To return to your message, just press F5.
Chris McGuire
Jeannette, Pennsylvania

64C and 128 disk storage: The slots on the rear of the top surface of these computers are convenient places for temporary storage of diskettes. Just stand the disk vertically in the slot; the slot edges will hold it there in a nearly vertical position. Since there are nine slots, each of which can hold three disks, your computer can hold up to 27 disks in this way.
Tyler A. Rosewood
Regina, Saskatchewan
Canada

Printer paper saver: Here's another use for those single sheets of tractor-feed paper. Tear off the left perforation in the normal way, but leave the right one alone. Use scissors to cut into the right perforation at the top and bottom of an area that is to become a "notebook tab," similar to the tabs on divider sheets you can buy in the store. Tear off the perforations above and below your "tab," and you have the world's cheapest notebook divider. By skillful use of the scissors, you can make a complete set of dividers, with tabs arrayed from top to bottom.
Robert Burnet
Islington, Ontario
Canada

User group meeting places: I'll never forget our first successful meeting at the local Pizza Hut—we loved it and so did the restaurant. Restaurants of all kinds welcome any group of people, especially if they buy food and if they come when business is slow. This is good to keep in mind if you can't find a regular meeting place. You can start out at the restaurant, then move when a more traditional place becomes available.

You can approach the restaurant in advance and ask them what nights they are slowest. They'll probably love to have you. When the meeting rolls around, be sure that everybody orders something, and keep the public domain library away from the food and drink!
A. M. Johnson, Jr.
Cary, North Carolina

Amiga screen cleaner: Sometimes when I write a program I want to eliminate the Workbench border containing the "gadgets." To do it, I make the window with an empty title bar, then set palette 0, palette 1 and palette 2 equal to each other. This easily gets rid of the border.
Jesse Peterson
Donahue, Iowa

Amiga default colors: When working in AmigaBASIC, sometimes the system's default colors are changed to an undesirable combination. You can return to the original defaults by stopping the program then doing this: press the right AMIGA key and the "R" key simultaneously, then quickly press the right AMIGA key and the period key. If it doesn't work the first time, try it again, this time more quickly.
Jesse Peterson
Donahue, Iowa

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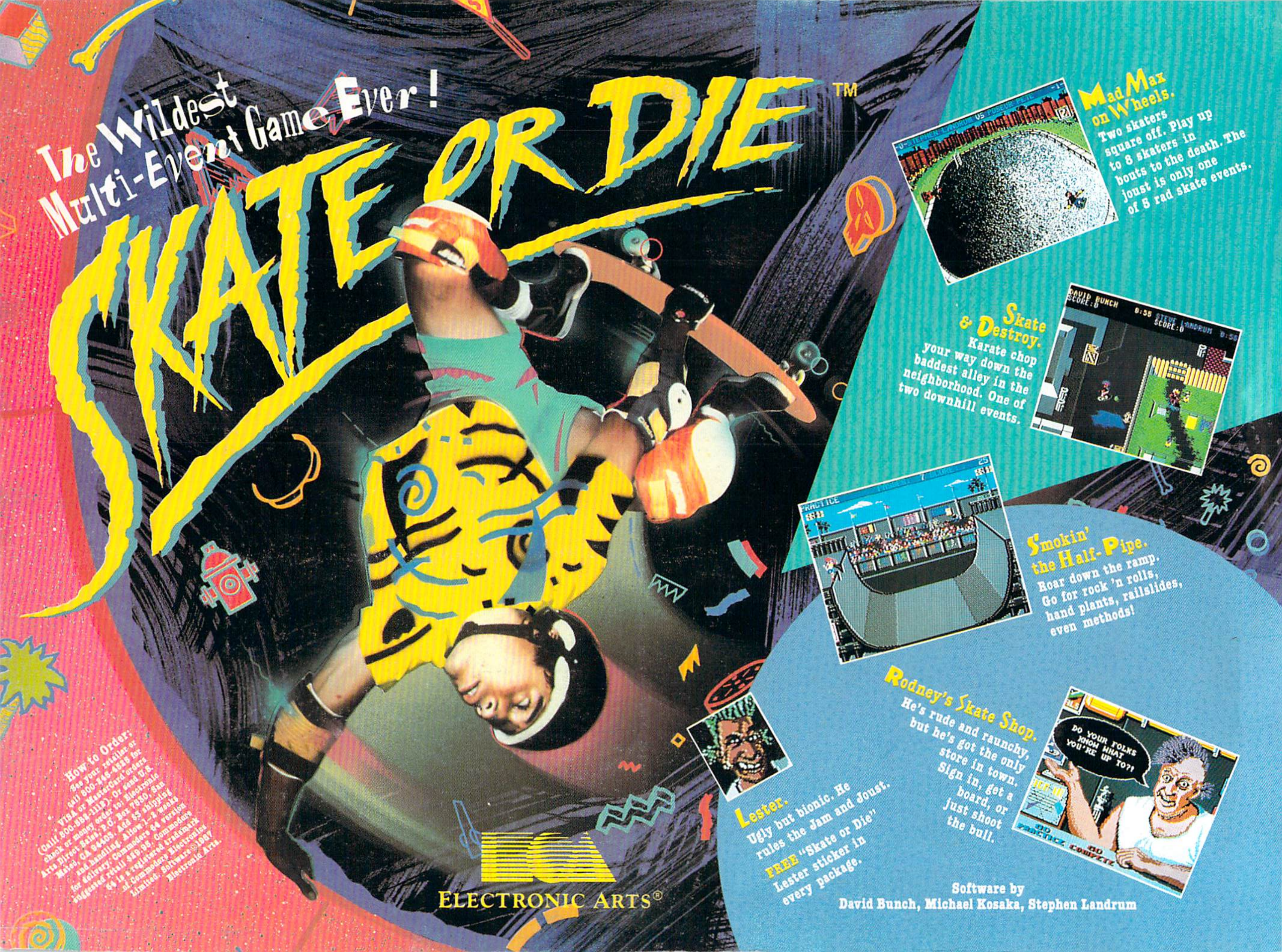
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